

failure or belated success? // History of Aviation. 2001. No. 6. P.31 (Yak-9U); Google Yu. Decree. op. P. 23 (Yak-9M, RM190A-8); Roma

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new V. Decree. op. P. 29 (B+11094-6); Akapiev V.L. Decree. op. P. 15 (B+1090-6); Rusetsky A. Focke-Wulf Em 190A, E, S. S. 24 (EM/190A-5).

377 Google Yu. Decree. op. S. 31; Aircraft building in the USSR. 1917-1945 Book. N.S. 111.

378 Compiled from: Aircraft building in the USSR 1917-1945. Book. I. S. 97, 111 (Yak-9T, La-5FN, Yak-3, La-7). The rates of climb of German fighters are calculated according to the data given in the publications indicated in notes 332-334 (B1109C-6 and PM190A DiA-5) and 377 (EAM190A-8) to this chapter.

379 Compiled according to: Aircraft building in the USSR. 1917-1945 Book. I.S. 95, 168, 169, 181 (Yak-9T, La-5FN, Yak-3, Yak-9EU, ERM/190A-8, Soviet engines); Leipnik D.L. Decree. cit.: S. 60-61 (Yak-9ED, Yak-9M; the table is based on the data of A.T. Stepants); Alekseenko V., Nikolsky M. Decree. op. S. 31 (La-5, La-5FN, La-7); Romanov V. Decree. op. S. 29 (V1109S-6); Rusetsky A. Focke-Wulf Em 190A, E, S. S. 51 (7PM/190A-5iA-6); Google Yu Decree. op. S. 31 (EM/190A-5); Honey is A.N. Focke-Wulf E\190. S. 64 (EM/190A-5 and A-8); Medved A.N., Khazanov D.B. "Focke-Wulf" RM 190. S. 19, 128 (BM / 8010-2); Firsov A.A. Decree. op. S. 94 (08605A).

The flight weight of the RM190A-5 is given for a non-bomb load.

According to other sources, the takeoff power of the VMM / 8010-2 was 1700 or 1724 hp. (See note 286 to this chapter).

380 [//Vabedissen V. Decree. op. S. 290; Lipfert V. Decree. op. S. 207.

381 Alekseenko V. Soviet Air Forces on the Eve and During the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3. 5.

382 Rusetsky A. Focke-Wulf Em190A, E. S. S. 19.

383 Baevsky G.A. Decree. op. S. 149.

384 See: Soviet aces. S. 16; Khazanov D. A long way to the front of the improved "nine" // History of Aviation. 2000. No. 3. S. 46. .

385 Kosminkov K. The Yak-3 fighter is a pilot's dream // Aviation Review. Issue 5. Kharkov, 1996. S. 23.

386 Sobolev D.A., Khazanov D.B. Decree. op. S. 207.

387 Calculated from: Aircraft building in the USSR. 1917-1945 Book. I. S. 235; Alekseenko V. Soviet Air Force on the eve and during the Great

Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3. 7.

388 Aviation Lend-Lease // Military History Journal. 1991. No. 2. S. 28.

389 In January - March 1944, 4 2/3 fighter groups flew on the P \ 190 on the Soviet-German front - | and Shgruppa and headquarters and the 15th (Spanish) detachment of the 51st fighter squadron "Mölders" and the II group of the 54th fighter squadron "Grunherz". Since March, RM / 190 fighters have been used only in the Ti P groups of the Grünherz and the headquarters detachment of the Mölders, and in the summer, the M group of the Grünherz and the III group of the 11th fighter squadron also fought on the Fokkers. .

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390 See: Alekseenko V. Soviet Air Forces on the Eve and During the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3. C.7. Fighters Yak-1, Yak-7 and Yak-9 of all modifications in 1944, 8709 were sent to the Red Army Air Force (ibid.), but several hundred of them were supposed to make the Yak-9EU - machines of a higher quality level, in horizontal speed approximately corresponding to La-5FN. In April-July 1944 alone, factories No. 82 and No. 166, which built the Yak-9U, sent 277 of these aircraft (out of 484 assembled). Taking into account the fact that in July the monthly plan of factories No. 82 and No. 166 amounted to a total of 157 Yak-9U and the fact that in this month both factories finally began to fulfill the assembly plan, it can be assumed that in August - December 1944 up to 800 Yak-9Us were assembled - and several hundred more of these fighters were sent to the troops (calculated according to: Khazanov D. Long way to the front of the improved "nine" // History of Aviation. 2000. No. 3. P. 43) . Therefore, we take the number of Yak-1, Yak-76, Yak-9M, Yak-9T, Yak-ED and Yak-9DD sent to the Red Army Air Force in the 44th to be approximately 8000 vehicles.

391 In 1944, 17,895 fighters were produced in the USSR, including 7,831 Yak-9s of all modifications (calculated according to: Aircraft Building in the USSR, 1917-1945, Book I.S. 235). From approx. 390 it can be seen that among the latter there were up to 1300 Yak-9Us with the VK-107A engine, therefore, approximately 6500-6600 vehicles remain for the Yakovlev-9s with the VK-105PF.

392 Drabkin A. I fought with aces of the Luftwaffe. pp. 102,111.

393 Ibid. pp. 101-102, 104.

394 Sh/vabedissen V. Decree. op. S. 290.

395 Khazanov D. A long way to the front of the improved "nine" // History of Aviation. 2000. No. 3.S.46.

396 Leipnik D.L.Decree. op. S. 60; Sokolov B.V. Vasily Stalin. Smolensk, 2000, p. 189.

397 Calculated according to: Alekseenko V. Soviet Air Forces on the eve and in the years of Ve-

of the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow...
2000. No. 3. 7.

398 Sobolev D.A., Khazanov D.B. Decree. op. P.210-211.

399 Aircraft building in the USSR 1917-1945. Book. I. S. 110 (cf.: Sobolev D. A., Khazanov D. B. Decree. cit. P. 211); Google Yu Decree. op. P. 36. 400 Compiled according to: Aircraft building in the USSR. 1917-1945 Book. NP. pp. 95, 96, 110 (Yak-9T, La-5FN, La-7, Yak-3, Yak-9U, V! 109S-10); Leip nickname D.L. Decree. op. pp. 60-61 (Yak-9ED, Yak-9M; the table is based on the data of A.T. Stepants); Alekseenko V., Nikolsky M. Decree. op. P.31 (La-5FN); Bulakh A. Me210 / 410 - failure or belated success? // History of Aviation. 2001. No. 6. S.31 (La-7); Romanov V. Decree. op. S.29 (B1109C-biK-4); Akapiev V.L. Decree. op. S. 15 (V1109S-6);

Google Yu Decree. op. S.23, 31, 36 (Yak-9M, V1109K-4, RM190A-8).

Since the B1109@-10 was an attempt to "bring the previously produced aircraft to the level of the K series" modification @ (Fir SOVA.A. op. P. 128) and the same engine as the B1109K-4,

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but to assume that the speed of B1109C-10 and VT109K-4 was almost the same - which is reflected in the table.

The values of the speed EM/1 900-9 were calculated by us according to the data given in the publications indicated in note 399 to this chapter.

401 Compiled according to: Aircraft building in the USSR. 1917-1945 Book. I. S. 97, 111 (Soviet fighters and EPM / 1900-9); Google Yu Decree. op. S. 36 (B1109K-4 and R1900-9). The climb rates of the remaining Ÿ1109Ÿ(-6 and Ÿ190Ÿ-8) were calculated by us according to the data given in the publications specified in notes 332 and 377 to this

chapter.

402 Compiled according to: Aircraft building in the USSR. 1917-1945 Book. I.S. 95, 168, 169, 181 (Yak-9T, La-5FN, La-7, Yak-3, Yak-9U, RM/190A-8 and 0-9, Soviet engines); Leipnik D.L. Decree. op. pp. 60-61 (Yak-9D, Yak-9M; the table is based on the data of A.T. Stepants); Alekseenko V., Nikolsky M. Decree. op. S. 31 (La-5FN); Romanov V. Decree. op. S. 29 (B11096-6); Google Yu Decree. op. S. 36 (B1109K-4); Medved A.N. Focke-Wulf EM/190. C. 64 (EM/190A-8 and 0-9); Medved A.N., Khazanov D.B. "Focke-Wulf" EM / 190. S. 19, 128 (BM \! 8010-2); Fir sov A.A. Decree. op. pp. 94, 128 (OVbO5A, OBM and OSM); Kudishin I. Focke-Wulf fighter [190]. S. 57 (Wuto213A).

According to other sources, the takeoff power of the VMM / 8010-2 was 1700 or 1724 hp. (See note 286 to this chapter).

403 See: Shvabedissen V. Decree. op. S. 290.

404 Aircraft building in the USSR 1917-1945 Book. 1. S. 81; Kuznetsov S. First Yak. S. 63; Sobolev D.A., Khazanov D.B. Decree. op. S. 178.

405 Kuznetsov S. Pervy Ya. S. 74.

406 Google Yu. Decree. op. S. 31; Aircraft building in the USSR 1917-1945. Book. P.S. 245, 257 (Spitfire MK.M \, which performed a turn at an altitude of 1000 m for 18.8 seconds during tests in the USSR, was worn out; for the sake of turn, the Spitfire and Focke-Wulf were also determined by worn-out copies of these machines).

407 Alekseenko V., Nikolsky M. Decree. op. S. 30; Sobolev D.A., Khazanov D.B. Decree. op. S. 186; Aircraft building in the USSR. 1917-1945 Book. N.S. 85, 257.

408 Fighter Tactics. C. 3.

409 Op. Quoted from: Yurchenko A.Mikhail Kibkalov. S. 31.

410 See Medved A.N., Khazanov D.B. "Focke-Wulf" EM / 190. S. 106; They are. MiG-3. S. 46.

411 SlickM. Aces of the Luftwaffe. pp. 160 (see also pp. 155 and 161).

412 Quoted from: Ibid. pp. 161-162.

413 J. E. Johnson, Decree. op. S. 152.

14 Tactics of Fighter Aviation. P. 10.

415 Ibid.

416Siege of Leningrad in documents of declassified archives. M.; SPb., 2004. S. 562.

417 Op. Quoted from: Rusetsky A. Focke-Wulf Em 190A, E S.S.21.

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418 Ibid. S. 8.

419 Fighter Aviation Tactics. P. 10.

420 Medved A.N., Khazanov D.B. "Focke-Wulf" RM! 190, p. 60; Asylyuf twaffe. RM/190 pilots on the Eastern Front. Riga, 1997.Ch. 1.C. 12.

421 Drabkin A. I fought in a fighter. S. 44, 359; He is. I fought with the aces of the Luftwaffe. S. 263.

422 Drabkin A. I fought in a fighter. pp. 320-321; He is. I fought with the Asamiluftwaffe. S. 28, 381.

423 || IT. Quoted from: Medved A.N. Focke-Wulf R\M190. S. 59.

424 Ratkin V. Hero of the Soviet Union Pyotr Vasilyevich Bazanov // World of Aviation. 1997. No. 1.S. 4.

425 Baevsky G.A. Decree. op. S. 227.

426 Aircraft building in the USSR 1917-1945. Book. I. S. 95; Alekseenko V., Nikolsky M. Decree. op. pp. 30-31.

427 Op. Quoted from: Rusetsky A. Focke-Wulf EM / 190A, E S. S. 19-20.

428 Ibid. S. 19.

429 Ignatiev G. V. Decree. op. S. 236.

430 Fighter Aviation Tactics. P. 10.

431 Ignatiev G. V. Decree. op. S. 84.

432 Shvabedissen V. Decree. op. S. 272.

433 Aircraft building in the USSR 1917-1945 Book. I. C 245, 257.

434 Pogrebnoy V. Sword and shield // People of immortal feat. Essays on twice and thrice Heroes of the Soviet Union. Book 2. M., 1975. S. 404.

435 See: Shvabedissen V. Decree. op. S. 290.

436 it. Quoted from: Rusetsky A. Focke-Wulf Em 190A, E S. S.21.

437 Op. by: There. S. 8.

438 Ibid. S. 23.

439 Ibid. pp. 21-22; Aces of the Luftwaffe. PM190 pilots on the Eastern Front. Part 2.C.5.

440 Sobolev D.A., Khazanov D.B. Decree. op. S. 199.

441 Kondratiev V. In the footsteps of Stalin's falcons. S. 37.

442 Ibid.; Maslov M. I-153. S. 17.

443 Zakharov G.N.I - fighter. M., 1985. S. 106.

444 However, N.G. Golodnikov, who flew in 1942 on the Mig-1 available in his 2nd Guards Composite Aviation Regiment of the Navy Air Force, claims that the forces on the rudders had to be applied small (Drab KINA. I fought in a fighter. P. 262), and V.I. Klimenko, who fought on the MiG-3 in 1941, generally believes that this aircraft "was simple" in piloting (Ibid., p. 34).

445 Aircraft building in the USSR 1917-1945 Book. I. S. 91.

446 /Akhurin A.I. Decree. op. S. 82.

447 Drabkin A. I fought with aces of the Luftwaffe. S. 293.

448 Aircraft building in the USSR 1917-1945 Book. I. S.94.

449 Op. according to: Rusetsky A. Focke-Wulf Em 190A, E S. S. 21,22.

450 Sobolev D.A., Khazanov D.B. Decree. op. pp. 199, 200.

451 Rusetsky A. Focke-Wulf Em 190A, E, S. S. 23, 22.

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452 Sobolev D.A., Khazanov D.B. Decree. op. S. 200.

453 See: Asyluftwaffe. PV190 pilots on the Eastern Front. Part 2.C.5.

454 Op. Quoted from: Yurchenko A. Mikhail Kibkalov. S. 31.

455 Op. Quoted from: Kosminkov K. The Yak-3 fighter is a pilot's dream. S. 22.

456 Aircraft building in the USSR 1917-1945 Book. I. S. 102.

457 Op. Quoted from: Kosminkov K. The Yak-3 fighter is a pilot's dream. S. 22.

458 The relative number of MiG-3s with this or other weapon variant was calculated according to: Medved A.N., Khazanov D.B. MiG-3. pp. 69, 83. The relative number of I-1bi I-153 with a stem or other armament variant was calculated according to: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. T. 1.S. 186-187; Maslov M.

- Fighter I-16. S. 33; Onge. I-153. pp. 30-31 (the fact that M.A. Maslov cites information not on the 22nd, but on June 1, 1941, is established by: On the question of monographs // Aviamaster. 1997. No. 4-5. P. 53). When calculating, we assumed that the number of I-153s of the Pacific Fleet Air Force, not indicated by M.A. Maslov, was 120-130 vehicles (see note 204 to this chapter), that only a few "gulls" with a BS machine gun were built in 1941 pieces and that the VVSVMF did not have such machines. After all, 1939-1940. 149 I-153s with BS were built - and exactly the same number of them were by June 1, 1941 in combat fighter air units of military districts (plus machines of air units of central subordination and an aviation plant).

459 Op. Quoted from: Zefirov M.V. Aces of the Luftwaffe. Bomber aviation. M., 2002.S. 229.

460 Bolotin D.N. Soviet small arms. M., 1990. S. 292; Khazanov D.B. Unknown battle in the skies of Moscow. 1941-1942 Defensive period. S. 75.

461 Bear A.N. Focke-Wulf EM/100. S. 58.

462 Drabkin A. I fought in a fighter. pp. 145, 179.

463 Bolotin D.N. Decree. op. S. 292.

464 Calculated according to: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. T. 1. S. 186-187; Maslov M. Fighter I-16. P. 33 (the fact that M.A. Maslov gives information not on June 22, but on June 1

, 1941, established according to: On the issue of monographs // Aviamaster. 1997. No. 4-5. S. 53). |

465 Vannikov B.L. Notes of the Commissar // Banner. 1988. No. 1.S. 145.

466 Rusetsky A. Focke-Wulf R \ m / 190A, E, S. S. 42; Shavrov V.B. Decree. op. P.430.

467 Markovsky V., Medved A. Weapon "pawn" // Aviamaster. 1997. No. 2.S.26.

468 Lagg-3. Riga, 1997, pp. 14-15. Wed: There. pp. 10-11.

469 Bolotin D.N.Decree. op. S. 292; Kuznetsov S. First Yak. S. 106.

470 Op. Quoted from: Yurchenko A. Mikhail Kibkalov. S. 33.

471 See: Ignatiev G. V. Decree. op. pp. 226, 238.

472 Archipenko F.F.Decree. op. S. 111.

473 Aircraft building in the USSR. 1917-1945 Book. P.S. 241.

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474 Kuznetsov S. First Yak. pp. 105-106; Shavrov V.B. Decree. op. S. 191; Leipnik D.L. Decree. op. pp. 12, 20, 39. According to other sources, the 20-mm cannon on the Yakovlev-9 consisted of 120 shells (Shavrov V.B. Decree. Op. P. 196).

475 Calculated from: Aviation Lend-Lease. S. 28.

476 Calculated according to: Romanov V. Decree. op. S. 21.

477 Calculated according to: Rusetsky A. Focke-Wulf Em 190A, E, C.C.7. According to other sources, the EM / 1.90A-4 ammunition load - which had the same weapons as the RM / 190A-3 and fighter submodifications R \ M / 190A 5 - consisted of 510 shells (calculated according to: Medved A.N. Fokke Wulff RM/LO0, p. 17).

478 Op. Quoted from: Rusetsky A. Focke-Wulf Em190A, E S. S.21.

479 DrabkinA. I fought on IL-2. S. 66.

480 Rusetsky A. Focke-Wulf Em 190A, E. S. S. 21; Damn a dozen aces of the Luftwaffe. S. 153.

481 Bolotind.N. Decree. op. S. 292.

482 DrabkinA. I fought with the aces of the Luftwaffe. S. 493.

483 Leipnik D.L. Decree. op. S. 17.

484 | \it. by: There.

485 Calculated according to: Romanov V. Decree. op. S. 21; Shavrov V.B. Decree. op. P. 191 (the author erroneously indicates that two UBS with 300 rounds of ammunition were on the Yak-7A); Leipnik D.L. Decree. op. P. 39. According to other sources, the ammunition load of one UBS on the Yakovlev-9 consisted of 200 rounds (Shavrov V.B. Decree. Op. P. 196).

486 Solonin M. At peacefully sleeping airfields... June 22, 1941. M.

2005, p. 163; Bolotin D.N. Decree. op. P. 292. According to other sources, the MC131 bullet weighed 34 g (Rusetsky A. Focke-Wulf Em 190OA, E, S. S. 42).

487 Solonin M. Decree. op. S. 163.

488 Firsov A.A. Decree. op. S. 97.

489 Calculated according to: Rusetsky A. Focke-Wulf Rome 190A, E.S.S. 42.

490 According to our calculations (see note 494 to this chapter), even in 1944, among the Soviet fighters used at the front, the share of machines with more powerful weapons than described was only about 20%. It is unlikely that in 1943 it was larger.

491 Kosminkov K. The Yak-3 fighter is a pilot's dream. S. 25.

492 Ibid. P.21.

493 Calculated according to: Alekseenko V. Soviet Air Forces on the Eve and During the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow ... 2000. No. 3. P. 8. Vedomosti published by V.I. Alekseenko does not distinguish "Yakovlev-9" with a 20-mm cannon and Yak ETs37-mm, as well as Yak-3 with one and two UBS. Since the Yak-9T was built in 2748 (Leipnik D.L. op. op. P. 60), i.e. approximately 19% of the total number of Yakovlev-9s released into the war (14,579 units; see: Fighters of the Second World War. 1939-1945. 1.M., 1994. P. 60), it can be assumed that in combat Return losses of the Yakovlev-9 in 1944 (1040 units) of the Yak-9ET also amounted to 19%, i.e. about 200 cars. In really

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sti - due to the fact that out of at least 1200 produced in the 44th Yak EU, only about 50 participated in the battle (see: Khazanov D. Long way to the front of the improved "nine" // History of Aviation. 2000. No. 3. P. 45; note 39092 to this chapter) - the share of the Yak-9T in the losses of the Yakovlev-9 should have been somewhat higher then; we assume that these aircraft with a 37-mm cannon were lost in 1944, but about 250. As for the Yak-3, it was assumed in the calculation that the first 200 Yakovlev-3s had, in addition to the cannon, only one machine gun, - they managed to send it completely from the factory in 1944 and that vehicles with one UBS therefore accounted for approximately 15% of all those used in 1944 at the Yakovlev-3 front (see: Alekseen ko V. Soviet Air Forces on the eve and during the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3. P. 7; Kosminkov K. The Yak-3 fighter is a pilot's dream. P. 21).

Under these assumptions, it turns out that in the irretrievable combat losses of Soviet fighters in 1944, the share of LaGG-3, Yak-1, Yakovlev-9 with a 20-mm cannon and Yak-3 with one UBS was approximately 40%; Yak-76, Yak-3 with two UBS and Yak-9U - about 8.5%; La-5, La-5FN and La-7 - 29.2%; "Kittyhawks" and "Hurricanes" - 1.5-2%, and Yak-9T and "Aero Cobras" - about 20.5% (including "Aero Cobras" - 13.3%). Taking into account the greater survivability of the "Lavochkin" and "Air Cobra" in comparison with the "Yakovlev", we can assume that among the fighters used by the Soviet Air Force in 1944 at the front of the LaGG-3 and "Yakovlev" fighters with

one 20-mm cannon and one UBS accounted for not about 40, but about 35%, "Yakovlevs" with one 20-mm cannon and two UBS - about 8%, "Lavochkins" - not 29, but about 35%, and Yak-9T and "aero cobra" - about 20%.

494 0 shell weight see: Shavrov V.B. Decree. op. S. 430; Rusetsky A. Focke-Wulf E\u190A, E, S. S. 42; Combat takeoffs. M., 1976. S. 166.

495 Shavrov V.B. Decree. op. S. 430; Drabkin A. I fought in a fighter. P. 254 (counting the number of shots per second is mine. - A.S.); Zefi rov M.V. Aces of the Luftwaffe. Day fighters. T. J. S. 411; Rusetsky A. Focke-Wulf R \ m / 190A, E, S. S. 42 (data on MC151 / 20). According to other sources, the rate of fire of the MK108 was 600 rounds per minute (Rusetsky A. Decree op. P. 42; Medved A.N. Focke Wulf P \ M / 100. P. 29). But this is incomparably more than the NS-37.

496 Leipnik D.L. Decree. op. pp. 60-61; Rusetsky A. Focke-Wulf Rm190A, E, S. S. 53 (for R \ M190A-5 A.I. Rusetsky gives data on the assault version; GM 90A-5 fighter modifications were armed in the same way as E \ / 190A-4 , whose salvo weight, according to A.I. Rusetsky, was 5.45 kg).

497 Firsov A.A. Decree. op. S. 96; Leipnik D.L. Decree. op. S. 17; Drabkin A. I fought in a fighter. S. 254.

498 Ignatiev G.V. Decree. op. pp. 236, 238; Zefirov M.V. Aces of World War II. Allies of the Luftwaffe. Hungary, Romania, Bulgaria, Croatia, Slovakia, Spain. S. 133; Lipfert V. Decree. op. S. 192.

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499 ||it. Quoted from: Krylov L., Tepsurkaev Yu. Nikolai Ivanovich Ivanov // World of Aviation. 1997. No. 2.S. 19.

500 Drabkin A. I fought with aces of the Luftwaffe. S. 56.

501 LipfertV. Decree. op. pp. 185-186.

501 See: Arkhipenko F. F. Decree. op. pp. 97, 98, 99, 121.

502 Lipfert V. Decree. op. S. 212.

503 See: Drabkin A. I fought with the aces of the Luftwaffe. pp. 306-308, 316-317, 320, 322, 329.

504rudel H.W. Dive Pilot // Bombs Dropped! M., 2002. S. 185-186; Khazanov D. Battle over Iasi. S. 19.

505 Calculated according to: Medved A.N. Focke-Wulf PM190. S. 47; Kosminov K. The Yak-3 fighter is a pilot's dream. S. 25; Leipnik D.L. Decree. op. S. 34.

506 See: Shavrov V.B. Decree. op. S. 430.

507 Kondratiev V. Comparative analysis of structures...S. 400-401.

508 Drabkin A. I fought in a fighter. pp. 106, 108; Onge. I fought with the aces of the Luftwaffe. P. 203. V.I. Klimenko, who fought in the 10th Guards Fighter Aviation Regiment, claims that the sights on the MiGG-3Z, Yak-1 and Yak-76 were "normal" - but clearly because, like himself he emphasizes that he did not use sights in battle ("You can look at the sight when you shoot at targets. But when you are already in the air, in battle, where everything is decided by moments, seconds, what kind of sight is there!") And aimed, adjusting the fire at the first released track (Drabkin A. Ya fought in a fighter jet, p. 43).

509 Kondratiev V. Comparative analysis of structures... P. 401.

510 Op. Quoted from: Chernikov E. Armored attack aircraft Il-2. M., 1997. S. 26.

511 Sobolev D.A., Khazanov D.B. Decree. op. P.210.

512 Drabkin A. I fought with aces of the Luftwaffe. pp. 115-116.

513 Sobolev D.A., Khazanov D.B. Decree. op. P.210.

514 Ibid.

515 Shvabedissen V. Decree. op. S. 290.

516 Arkhipenko F.F. Decree. Op. S. 52. B.N. Eremin, on the contrary, claims that the LaGG-3 "burned strongly" and burned precisely because of the all-wood construction. But Eremin did not fight on Laggas, and S.D. Gorelov, who flew them in 1941 in the 165th Fighter Regiment, is in solidarity with F.F. Arkhipenko: LaGG-3 "does not burn" (Drabkin A. I fought on destroyer, pp. 145, 337).

517 Shvabedissen V. Decree. op. pp. 84, 85.

518 Perov V.I., Rastrenin O.V. Assault aviation of the Red Army. T.1.S. 130.

519 Op. by: There.

520 Romanov V. Decree. op. P.28.

521 Sobolev D.A., Khazanov D.B. Decree. op. P.210.

522 Alekseenko V. Soviet Air Force on the eve and in the years of the Great Fatherland

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military war // Aviation and cosmonautics yesterday, today, tomorrow ... 2000. No. 3.ÿ.5.

523 Drabkin A. I fought with aces of the Luftwaffe. S. 216.

524 Ibid. pp. 250-251.

525 Alekseenko V., Nikolsky M. Decree. op. S. 23.

526 Op. by: Devil's dozen aces of the Luftwaffe. S. 224.

527 Kosminkov K. The Yak-3 fighter is a pilot's dream. S. 21.

528 Baevsky G.A. Decree. op. S. 118.

529 Drabkin A. I fought with the Sasami of the Luftwaffe. pp. 29, 90, 100, 432; Onge. I fought in a fighter jet. S. 273.

530 Op. by: Devil's dozen aces of the Luftwaffe. S. 149.

531 Medved A.N., Khazanov D.B. "Focke-Wulf" RM / 190. S. 105.

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Part II

AVAILABLE AVIATION

In this part, we will talk about "battlefield aviation", i.e. about air units intended for direct support of their troops on the battlefield. In the USSR, these air units were part of attack aviation; in Germany - first as part of the bomber squadron (squadron of dive bombers - *Sturzkampfgeschwader* - and high-speed bombers - *Sturmgrupp* and fighter squadron (squadron of attack aircraft - *Sturzkampfgeschwader* - and fighter-bombers - *Sturzkampfgeschwader*), and from September 1943 - in the attack aviation.

Chapter III

COMBAT WORK

OF SOVIET ATTACK AVIATION

In the first weeks of the war, most of the assault aviation regiments of the Soviet Air Force were armed with I-15 and I-153 fighters, but until the end of 1941, the latter were supplanted by the IL-2 attack aircraft designed in the Design Bureau of S.V. Ilyushin and produced since March 41 - which remained the only type of aircraft of the Soviet attack aviation almost until the very end of the war. Only in April 1945, and only in three attack aviation regiments (108th and 118th Guards and 571st), did the IL-10 attack aircraft launched into mass production in the fall of 1944 begin to be used.

Perhaps not a single Soviet aircraft of the Great Patriotic War was written in such laudatory tones,

how about IL-2. His combat work was rated as exceptional.

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definitively effective; Impressive numbers of destroyed tanks, vehicles, guns, soldiers and officers, etc. were usually cited as confirmation. - as well as enthusiastic reviews of the infantrymen, in whose interests the "humpbacks" acted (as the Il-2 was friendly called in the Red Army because of the cockpit canopy that protruded sharply above the fuselage). As the features that determined the success of the Ilyushin attack aircraft, powerful small arms and cannon armament, reliable armor ("flying tank"!) And exceptional survivability of the design were called. In our attempts to verify and clarify these estimates, we will rely primarily on the monographs of V.I.

1. HOW EFFECTIVE WAS THE COMBAT WORK OF THE IL-2 ATTACK ROV?

Immediately, we note that the figures cited in the domestic literature for the loss of the enemy in manpower and equipment from Il-2 strikes are many times overestimated. After all, they were drawn not from the documents of the party that was subjected to these strikes, but, as a rule, from the reports and reports of Soviet aviation units, formations and associations. And these sources are extremely unreliable. Firstly, they are based on the reports of the Il-2 crews who returned from combat missions, and the crews, by definition, could not bring accurate information about the damage they inflicted on the enemy. In a matter of seconds (while the target was being approached), they simply did not have time to notice and accurately count everything they destroyed - and often they could not even consider anything. "On the way out of the dive, I try to see the results of the work of the group," describes a typical situation, the former pilot of the 103rd assault aviation regiment K.F. Belokon, "but this is not possible: where the tanks just went, the road is in solid smoke" !. Even more eloquent entry in the diary

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air gunner G. Dobrova from the 198th assault: "We are going out of a dive. I see bomb explosions, the target is covered with smoke and dust. What's going on there? After the war, we will figure out what's what? As a rule, the crews exaggerated their successes: they affected both the natural desire to cause as much damage to the enemy as possible (which prompted them to sincerely believe in their success!), And the desire to present their actions in the best light ... _

Secondly, some of the information about the combat work of the Il-2, contained in the reports and reports of units, formations and associations of the Soviet Air Force, was simply invented (\$ 1s!) by those who compiled or approved these documents. After all, the command also wanted to brag about its successes - and it often "corrected" (naturally, upwards) the numbers of enemy losses indicated in the reports of the crews or lower headquarters, or even completely added for them. For example, "the vast majority of reports from the regiments" involved in airstrikes against the troops of the 2nd Wehrmacht Panzer Group in the Bryansk region on August 30-September 11, 1941, did not contain "accurate data on destroyed and damaged German tanks, armored vehicles, etc. .d." - only "the number of large explosions and fires noted by the crews, or (in rare cases) the number of direct hits [...] of a tank, car, etc." was indicated. "But in the reports of the headquarters of the formations, hundreds of destroyed enemy soldiers and officers, dozens of tanks, armored vehicles, guns and other military equipment appeared with might and main." In general, the true losses of the 2nd Panzer Group from air strikes turned out to be overestimated by 2-5 times ... 3 And here is another typical example. On May 6, 1943, having struck at the Orel-Central, Lavrovo and Khmelevaya airfields, the crews of the 58th and 79th Guards assault aviation regiments reported the destruction and damage on the ground to 10-11 German aircraft, the headquarters of the 2nd Guards assault air division, reporting to the headquarters of the 16th Air Army of the Central Front, reported already about 17 aircraft - and even stipulated that, according to the reports of the fighter pilots covering the "silts", up to 80 were burning at the airfields

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110 aircraft. ("It is interesting," notes O.V. Rastrenin, "what could the fighters confirm if, as follows from the reports of the attack aircraft, and the fighters themselves, they were not over the airfields, but "hung out" on the side"? ..) Well, the army headquarters reported to the commander of the Red Army Air Force about the destruction and damage at three airfields "lo 54" aircraft ... 4 I

Nor can the testimonies of prisoners of war be considered reliable. In addition to the desire of the prisoner to say what it would be nice to hear from those on whom his fate depended (see about this in the chapter [of this work], he could rarely be sufficiently informed about the losses suffered by his unit, part, and even more so, the loss. For some reason, none of the domestic researchers referring to testimonies like those given about the Il-2 attacks on German columns on the Mogilev-Minsk highway at the end of June 1944, Corporal A. Friedrich ([...] Losses during raids often equal I believe that in our column up to 50% of the entire composition was lost from the raids of Russian aircraft ... ">), I do not ask the question: how could the corporal of the working railway battalion know about the magnitude of the losses in the columns of other parts? In that pitch hell, which was the roads of the Minsk "cauldron", this information

certainly did not reach the commander of the unit ... To admit that, having barely recovered from the bombing, Friedrich (apparently overwhelmed by concerns about the needs of future historians) first of all rushed to count the losses in the columns stretched for kilometers (arbitrarily leaving under this is the location of his unit!), at least naive ... And who reported to another such "informant" - corporal of the 394th motorized infantry regiment of the 3rd tank division of the Wehrmacht - that as a result of an IL-2 raid on his battalion 6 July 1943, on the southern face of the Kursk salient, 120 people died and 90 vehicles burned down? 6 Was he a battalion or regiment commander? Or he, too, for the benefit of future historians, in the fire of the incredibly tense Battle of Kursk, found

ly and time to run around the location of the unit and count the kill
tyh?

10A. Smirnov 289

True, since 1943 the Soviet command also had at its disposal materials of objective control - photographic or film films. The group of IL-2 flying on a combat mission increasingly began to include an attack aircraft with a photo or movie camera; closing the battle formation, he had to record the results of the strike. However, even here there was no guarantee that everything destroyed by the "humpbacks" would fall into the lens. In addition, A.N. Efimov, who fought in the 198th 62nd assault aviation regiments, adds, "the photograph may not turn out. The moment of shooting did not always coincide with the explosion. Often the results of the bombing were obscured by smoke. Yes, and such a photograph was not brought from every flight: once in the thick of anti-aircraft fire, the pilots sometimes forgot to turn on the camera or decided that they were "not in the mood for shooting", and the photographers (forced to fly at a constant speed at the same height) were easily lost. To some "silts" (for example, in the 566th assault aviation regiment of the 277th assault aviation division of the 13th air army of the Leningrad Front) in 1944-1945. machine guns were set up for photo-cinema, but they fixed only where the machine-gun and cannon tracks lay. Finally, the command for sure did not take into account the photo control data if they did not provide the numbers necessary for reporting "upstairs" ... One way or another, in the reports of aviators, enemy losses from IL-2 strikes were exaggerated after 1943. This was revealed by ground-based inspectors - visiting commissions of the headquarters of air divisions, air armies and the Air Force Research Institute to establish the real effectiveness of ground attack aviation (in 1943-1945 it was already possible to survey the areas in which the IL-2 worked: it was general retreat of the enemy). So, the commission of the headquarters of the 230th assault air division of the 4th air army of the 2nd Belorussian Front, having left for the places where at the beginning of the East Prussian operation, on January 16-20, 1945, the "silts" of this division operated, established January 31 that "the amount of destroyed equipment found during the inspection process" is only 30% of the figures indicated in

shtadiva reports. For example, in the area of Vilen roads

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berg - Gross-Walde, Ortelsburg - Alt-Kaytush and Shshas nysch - Gabovo - Kaytush attack aircraft destroyed and damaged not 19 (as indicated in the reports), but 9 tanks; not 18, but 3 guns; not 85, but 18 cars and buses; not 2, but 1 locomotive; not 25, but 6 railway cars. Corresponding to reality was only information about the destruction of one self-propelled gun and the destruction of one crossing. Naturally, the commission could not find out whether "510 soldiers and officers" were really destroyed; it is clear that no photo or filming would have given such an exact figure ...

The huge overestimation of the official Soviet data on the results of the IL-2 actions is also revealed when referring to German sources. Thus, from the lists of losses of the German Navy, it is clear that during the entire war the enemy did not lose a single submarine in the Baltic Sea from Soviet air strikes - and that, consequently, the allegations of the sinking of four submarines do not correspond to reality). According to the Germans, during the Kerch-Eltigen operation, from November 1 to December 8, 1943, the "silt" of the 11th assault air division of the Black Sea Fleet Air Force sank only 14 and damaged 6 ships and vessels - and not 42, as reported division headquarters ...! 0 The results of the strikes by the Guards and 2nd assault air corps of the 5th Air Army of the 2nd Ukrainian Front on the Khushi and Roman airfields near Yassy. On May 29, 1944, the Soviet side overestimated and did 2 times, and the results of the "silt" raid of the 215th assault air regiment of the Air Force of the Western Front at the Smolensk-Severnoy airfield on September 15, 1941 - 15 times. According to German sources, in the first case, the "silt" managed to burn or damage only 5 aircraft (and not about 60, as stated in Soviet reports), and in the second, they failed to destroy any of the 15 German bombers then listed on the account of the regiment (only blow up the ammunition depot)...!!`

And what is the value of the figure of 205 tanks allegedly destroyed by the same 215th regiment from August 28 to October 10, 1941?12

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With such effectiveness, 11-12 IL-2 regiments in just a month and a half should have destroyed all 2326 tanks irretrievably lost by the Germans (according to their data) over a much longer period of time - from June 22 to November 41! And this is on condition that German tanks will not burn either bomber crews, or tankers, or artillerymen, or infantrymen ... But in September - October 1941, not 11-12 fought on the Soviet-German front,

a21 regiment IL-214. Acting with the same efficiency as the 215th, in a month and a half they would have to destroy about 4300 German tanks, i.e. almost all who were brought into battle against the Red Army at any time (about 4200, available in the East by June 22, plus up to 600 received as replenishment before November 10, 1941! 5). However, as is known, such a quick and almost complete destruction of the German tank forces in the 41st did not happen - although, we repeat, not only the IL-2, but the entire Red Army fought with machine tools ... According to information from German sources collected by General Lieutenant of the Wehrmacht Huffman, the strikes of Soviet attack aircraft in the northern and central sectors of the Soviet-German front (i.e., in the area of operations of the 215th regiment) in 1941 were generally "not very effective"! (There were, of course, exceptions; for example, according to German data, an air strike on the Siverskaya airfield near Leningrad on November 6, 1941 - the main success in which, according to the Soviet side, was achieved by six IL-2s from the 174th assault aviation regiment - led to the destruction of 7 Junkers La88 bombers and most of the fuel reserves!

The huge overestimation by Soviet crews and headquarters of data on enemy losses from IL-2 strikes is also evidenced by the results of tests conducted during the war years at the Aviation Weapons Research Range (NIPAV) in order to determine the real combat effectiveness of the "humped". They, in particular, showed that in 1941 the "silt" practically could not destroy non-German tanks with cannon fire. Armor-piercing incendiary shells of 20-mm ShVAK guns were capable of penetrating

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only armor no more than 15 mm thick, i.e. for light tanks R7KrÿmP and R7Krÿm38 ({} and a few medium R2KrEMU Ach \$ G.A, Vi C - stern and part of the side sheets of the hull (au R2Krÿ \ iP - and towers), the roof of the tower and the engine compartment; the medium tank R7KrÿP has only the roof of the turret and the engine compartment, while the medium R2KrÿmGU Ai. Oh E&E| — Only the roof of the engine compartment! 8. At the same time, the angle of the meeting of the projectile with the armor was supposed to be close to 90 °, and the firing distance should not exceed 250-300 m. However, in 1941, tanks attacked IL-2 only when they walked in columns along the roads - and only along the columns (or at an angle of 15-20° to the direction of their movement). Consequently, penetration of the side armor of the tanks was ruled out. And since the attacks on the columns with "silt" in the 41st were carried out only from a strafing flight (i.e., from a very gentle gliding), the penetration of the armor of the roof of the tower and the engine compartment was also excluded: getting into these horizontal sheets at an angle of 5— 10°, the shells simply ricocheted. Consequently, only the stern plates of the hull (au R"KremP and towers) of light and a small number of medium tanks remained - but in practice they did not always break through from ShVAK either: in the 41st, the pilots of the "silt" opened fire from too large distances (500-600 m). Parts of IL-2

instead of ShVAK, there were 23-mm VYa cannons, but their more powerful shells had only the advantage here that they penetrated 15-mm armor carrying 250-300, as 300-400 m. The probability of hitting a light tank with the tactics described above only slightly increased (and there were very few cars with VY at that time). .

It should also be taken into account that in the 41st, Soviet attack pilots did not aim at any specific KU tan, but at the "column in general" - and this, as a rule, led to continuous misses. Thus, three pilots of the 245th Assault Aviation Regiment attacked a motorized mechanized column 600 m long at the training ground in the standard way in 1941, fired 300 shells from the ShVAK, but did not achieve a single hit on the tank!9. And VYa with their lower rate of fire (600 rounds per minute versus 800 for ShVAK? 0)

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should have given an even lower percentage of hits. In addition, the Zhev41 ShVAK (which did not have a debugged reloading system) and VYa often failed.

In addition to guns, IL-2 in 1941 had RS-82 and RS-132 rockets; this weapon made it possible to destroy any German tank of that time - but only with a direct hit. The rupture of the RS-82 did not cause any damage to the latter even in 0.5-1 m; did not cause significant harm in this case and RS-132. The probability of a direct hit of the "eres" in the tank (when launching a projectile from a dive at an angle of 30 ° and from a distance of 300 m) for a good pilot was 25% if he fired a volley with all eight RS, 8% - if only four, and fractions of a percent - if he produced only one "eres"? The dispersion of these shells was too great ... In other words, under the indicated conditions, in order to guarantee the destruction of one tank by "eres" in one run (and Soviet pilots in the 41st, as a rule, did not do more) it had to be attacked respectively 4, 12-13 and over 100 Il-2. And this is at the training ground, where the anti-aircraft fire of the enemy did not interfere with the targeted launch of the RS! At the front, the probability of an "eres" hitting a tank was further reduced by the fact that combatant pilots fired from too large distances (600-700 m) and from a strafing flight (which made aiming difficult); a volley was fired with less than four shells - and in general they were worse prepared than the NIPAV testers.

Finally, another Il-2 weapon - air bombs - could disable the tank both with a direct hit and with a close gap. Fragments of a 50-kg FAB-50 high explosive pierced the armor of a tank (albeit only a light one) from a distance of up to 0.5-1 m, and fragments and a blast wave of a 100-kg FAB-100 from 1-5 m also hit a medium tank? However, the bombing accuracy of the Il-2 in 1941 was extremely low. The pilots of the "humpbacked" then bombed only from a horizontal flight - and the bomb sights they had were for this

completely unsuitable. The one that was installed in the summer of the 41st - UPS-16 - with the bomb generally accepted at that time

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bombing from ultra-low (5-25 m) heights was very difficult to use. After all, in such a dangerous proximity to the ground, the pilot's attention involuntarily focused on controlling the aircraft - and aiming with the help of the UPS-16 took time. At altitudes above 25, the mPBP-16 turned out to be useless at all: the long hood of the IL-2 limited the view down there so much that it was simply impossible to catch the target in the scope! Therefore, the pilots of the "humpbacked" dropped bombs simply by the time delay - "which was tantamount to almost aimless bombing" ... In the autumn of 41, they began to aim with the help of special marks applied to the canopy of the cockpit and the hood - but they also "did not ensure the required accuracy of bombing"?3.

As a result, the average probability of hitting one IL-2 in one sortie of one German light tank (taking into account the opposition of German anti-aircraft guns and fighters) in 1941 was only about 5.5% (an armored personnel carrier - 7%) -4. In other words, for the guaranteed destruction of one R7KrÿMP or R7Krÿ38({) it was necessary to send 18-19 attack aircraft. Apparently, no less was required for the destruction of one medium tank R7UKRÿUSH or R7KremGU with the help of the FAB-100. Shrapnel and a blast wave hit them from a greater distance than a light tank, but during the first year of the war, bombing from a strafing flight of the "weave" often ricocheted and exploded quite far away (after all, their fuses - in order to avoid hitting a low-flying attack aircraft, a fragment own bombs - were set with a 22-second slowdown). However, more often than not, the probability of destroying a German medium tank in 1941 by a "humpback" was generally equal to zero! After all, FAB-100 bombs are the only weapon dangerous for these machines - IL-2 was used very rarely in the initial period of the war. So, in the assault air regiments that fought in August 1941 - January 1942 in the Western direction, only 4% of all dropped bombs fell on the "hundredths" -? °.

Thus, in 1941, the chances of destroying the German

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tank IL-2 were negligible. However, in the reports of the aviation headquarters, the effectiveness of the "humpbacked" strikes on tanks miraculously increased by an order of magnitude, or even by two! For example, on September 8, 1941, a unit of "silts" of the 241st assault aviation regiment of the 1st reserve air group, attacking a tank column of about 50 vehicles in the Bryansk region, allegedly destroyed

5 tanks²⁶. It turns out that three attack aircraft achieved a result that only 20 to 65 Il-2s could provide even at the training ground and with more efficient methods of using RS! Even more incredible is the success allegedly achieved on November 11, 1941 by the unit of the 312th assault aviation regiment of the Air Force of the Western Front during the attack of a motorized mechanized column in the Volokolamsk direction: 18 tanks destroyed? In other words, this is a result that, even in range conditions, could only be achieved by 72 to 234 Il-2s, if "eres" were used (and even then without adjusting for the lower efficiency of the front-line launch method), and from 324 to 342, if they were used high-explosive bombs. But the column did not consist of tanks alone: according to the official version, the link also destroyed 50 vehicles! It is impossible to explain such an incredible increase in performance by the fact that the pilots used all types of weapons at the same time. Field trials showed that simultaneous firing from two types of Il-2 weapons (for example, from cannons and "eresami"), on the contrary, reduced the effectiveness of one of them by about 20-70%²⁸ ... There are, therefore, obvious postscripts. There are many such examples. So, V.I. Perov and O.V. Rastrenin note that information about enemy losses from Il-2 strikes, cited "in most reports of the headquarters of the Bryansk Front and the operational group of the headquarters of the Air Force of the KA [Red Army. - A.S.]" for August 30 - September 11, 1941, "are not consistent with any of the results of field tests available to the authors to determine the effectiveness of the IL-2 weapon against German military equipment, as well as with the results of the work of special field commissions [...]

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on the assessment of the real combat effectiveness of attack aircraft in the period 1943-1945"²⁹.

As for cars, the average probability of destroying one car in 1941 with one Il-2 in a water sortie (taking into account the opposition of German fighters and anti-aircraft guns) was 14.5%³⁹. Consequently, for the guaranteed destruction of one car, 7 attack aircraft were required. Meanwhile, as we saw from the reports, on November 11, 1941, three "silts" of the 312th regiment, during an attack on a motorized mechanized column, burned 50 vehicles (i.e., they demonstrated efficiency, 116-117 times greater) ... True, V.I. Perov and O.V. Rastrenin indicate that in the 41st, the "effectiveness of side fire" of the Il-2 on cars, armored personnel carriers, guns, etc. following in columns. was "rather high" due to the huge length of the columns (i.e., the significant size of the target). However, in the very next phrase, these authors, contradicting themselves, note that "aiming at the "column in general" [and that was the only way the Il-2 pilots aimed in 1941 - A.S.], as field tests showed, in most cases gave low shooting accuracy, and attacking the target [...] only led to aimless waste of ammunition with little or no damage to

enemy"?1.

The probability of one vehicle being destroyed by one "silt" in one run did not increase even after 1942, when attack aircraft began to hit the convoys with cannons not from a strafing flight, but from a dive at an angle of 30 °. As shown by field tests and combat experience (the latter, it is possible, was analyzed on the basis of inflated figures from reports!), With a typical firing distance of 400 m, even for a pilot with good flight and shooting skills, it did not exceed 10-13% 32.

What has been said above does not contradict the well-known fact that at the end of June 1944, during the Minsk operation, strikes by attack aircraft of the 4th Air Army of the 2nd Belorussian Front on many kilometers of motorized mechanized columns of the 4th Army of the Germans on the Mogilev - Belyniichi - Berezino really caused the enemy - according to

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the former commander of the affected army, K. von Tip pelskirch - "huge losses"33. The Il-2 pilots who smashed these columns acted much more competently than their comrades in the 41st - they not only attacked from a dive (and not at low level), not only aimed at a specific vehicle from the column (and not at the "column in general"), but also carried out several aimed strikes in one run - each time making a "slide" and diving onto the column again. In addition, after the only crossing over the Berezina near the village of Berezino was destroyed, colossal traffic jams arose on the road, turning the columns - so moving in several rows - into a kind of motionless accumulation of vehicles. This, of course, made it much easier for attack aircraft to hit targets. The results of field tests also confirm the overestimation in the reports of the number of enemy aircraft destroyed by IL-2 attack aircraft at airfields. On average, subject to the performance of 2-3 visits to the target with cannon fire, one Il-2 in 1942-1943. I can destroy no more than one aircraft the size of a twin-engine Heinkel He! 11" (usually, to achieve such a result, it was necessary to send two attack aircraft)3 ". But according to the reports of the aviators, for the destruction on August 12, 1942 at the Don airfields of Oblivskoye, Olkhovskoye and Podolkhovskoye by cannon fire 89 bombers 188 and fighters "Messerschmitt 109" turned out to be sufficient only 21 "silt" out of 206, 226th and 228- th assault air divisions of the 8th Air Army of the South-Eastern Front35. In other words, in the reports - based in this case not only on the reports of the crews, but also on such an equally unreliable source as information from undercover intelligence - the effectiveness of the actions of the "humpbacked" increases immediately at least 4 times, which, Of course it's highly suspicious...

In addition to sources that directly or indirectly prove the overestimation of the official Soviet figures of enemy losses from the blows of the "humpbacked" - Wehrmacht documents, documents

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cops of the Soviet commissions on checking the effectiveness of ground attack aviation, reports on field tests of the IL-2 weapons, there are also general assessments of the combat work of the IL-2, given by the German side that was subjected to their strikes. They also indicate that the actions of the IL-2 were far from being as effective as is commonly believed in our country. Thus, "positive results" in attacks on tanks "directly on the battlefield", according to German front-line officers, even at the beginning of 1945 were achieved only "from time to time"³⁶. In attacks on front-line airfields, "according to the reports of the German headquarters," the successes of the IL-2 in 1942-1943. "were insignificant." As it is clear from the text of Luftwaffe General W. Schwabe Diessen, who summarized the German assessments, these successes were not too noticeable in 1944. And only in the spring of 1945, Schwabedissen points out, did Soviet attack aircraft strike airfields begin to cause the Germans "significant losses among ground personnel and equipment" - such that "the operational capabilities of German aviation decreased"³⁷.

True, on the whole, the actions of the Soviet attack aviation after 1941 are highly appreciated by the enemy side. The same Schwabedissen - summarizing the opinions of a number of officers and generals of the Wehrmacht - notes that already in 1942-1943. IL-2 achieved "significant success in supporting ground forces" (and above all in strikes against German defense strongholds), and in 1944-1945. "Gradually, ground attack aviation operations reached a high degree of efficiency and inflicted significant damage on the German army." "By their continuous and successful attacks in support of large ground offensive operations," this author continues, "Soviet attack aircraft played an important role in crushing German resistance."³⁸ However, in other places of his work, Schwabedissen points out that in 1942 the effectiveness of the actions of Soviet ground attack aviation was still "insignificant", that even in 1944-1945 "in most cases the effect achieved was more psychological than material.

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rakter", and that until the end of 1944 - due to the opposition of German anti-aircraft guns and fighters that had not yet weakened - the results achieved by the IL-2 "were small" ... ³⁹

The work of V. Schwabedissen is generally replete with mutually exclusive statements - both due to its insufficient editing, and due to the frequent substitution of ana-

lysis by mechanical addition of opposite estimates. (Declaring, for example, that in the Battle of Stalingrad "Russian ground attack aviation demonstrated in full what heights it could reach by that time," the German general immediately states that "inexperience and the lack of a proper number of trained crews did not allow the attack aircraft to demonstrate all their potential, and their attacks and victories were most often of a local nature"...10) However, in the case we are now examining, Schwabedissen's contradiction is perhaps only apparent.

First, "an important role in the suppression of German resistance" by the strikes of Soviet attack aircraft should have been played even if the effect they caused "was more of a psychological than material nature." The moral impact of the Il-2 attacks on Wehrmacht servicemen was already enormous in 1941, when the "humpbacks" still acted in small groups, occasionally and on the whole less skillfully than later. Analyzing the actions of the Il-2 near Moscow at the end of the 41st, Soviet experts from the Air Force Research Institute noted the low shooting training of pilots, the imperfection of sights, the material part of VYa cannons, etc. 41 - however, this imperfection was enough for the German corporal G. Meinecke. "When they come with their air guns," he wrote home from near Moscow on December 15, 1941, "we all try to hide well: there is no time for jokes"42. "Armored attack aircraft are unpleasantly perceived by the German troops," another participant in the Moscow battle, commander of the 2nd tank army of the Germans G. Guderian \ 3, reported to the 41st Wehrmacht High Command in mid-November. How much this psychological effect should have increased in 1944-1945, when the Il-2 strikes on the front line of the Germans became massive

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shaped and, in essence, incessant! The Soviet ground attack aircraft, W. Schwabedissen emphasizes, speaking about this period, "was practically continuously in the air or sequentially, wave after wave struck German positions, trying to "wear down [emphasis added by me. — A.S.] German defenses and silence or retreat [emphasis mine. - A.S.] enemy infantry" "4. Even if the German grenadiers remained safe and sound after these blows, they really should have been exhausted - both physically and mentally - and, accordingly, their stamina should have decreased.

Under the blows of the IL-2, the Wehrmacht artillery began to work worse. "It is very important for us that aviation destroy targets," the former commander of the 3rd Army of the 1st Belorussian Front, A.V. positions. When our aviation is over the enemy, then his cannon artillery and mortars, if they do not stop firing, then shoot

significantly less. This is what is needed for the advancing infantry. The commanders of the ground units of the 1st Belorussian Front also testified to the same, who in April 1945, during street fighting in Berlin, asked the aviators, who were afraid to hit their own in this confusion, not to stop sorties. "Let the pilots not bomb and shoot," they said, "but pass once or twice at low level over the Nazis. Hearing the rumble of aircraft, the Nazis hide, stop firing. And this is all we need: we immediately break into the strong point. And here is a message from a veteran of the 566th assault aviation regiment, Yu. So the infantry commander says: "You guys don't shoot. Come and at least sign up. Enough" "7. (Now the numerous rave reviews of Soviet infantrymen about the combat work of the IL-2 are becoming clear!)

. Secondly, W. Schwabedissen has no contradiction in

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assessment of the amount of material damage inflicted on the Wehrmacht by Soviet attack aircraft. This damage became "significant", as the German author says, "gradually" - and became such only at the end of 1944. Indicative, in particular, are the memoirs of German officers who fought in 1943-1944. as part of Army Group North. G. Biederman from the 437th Infantry Regiment of the 132nd Infantry Division directly or indirectly mentions the IL-2 four times. Reporting that on August 14, 1943, during the battles near Mgoy, the battle group called to restore the situation in the division's sector "was almost continuously attacked by non-friendly attack aircraft," he sums up: "By evening, the main line of defense was still in our hands." The memoirist does not speak of any material damage from the strikes of the "silt" even at his second mention of them (referring to the same battles) and even at the third (noting that in September-October 1944, near Riga, "an ominous appearance Russian attack aircraft became a constant feature" of reality, he only remembers how "they rumbled over the tiled roofs"). And only in November 1944, in the chickens of the LANDSK "KOTLE", "endless executions from the air" led (and even then only coupled with the actions of Soviet artillery and the autumn thaw) to constant interruptions in the supply of troops on the front line ... 18 O. Carius from the 502nd heavy tank battalion - who noted, among other things, the high efficiency of the assault actions of Soviet fighters - talking about the March and April battles of 1944 near Narva, also does not report anything about the damage from the attacks he mentioned twice IL-2. And describing the strike of Soviet attack aircraft on June 26, 1944 near the village of Zue in the north-east of Ostrov, he notes that the "tigers" "were not harmed by numerous bombs" (at that time, the "silts" already had terrible and heavy tanks with cumulative bombs. - A.S.), nor rockets. The nickname given by the Germans to IL-2 "zsn \ ar2e To" in ad-

quat (and not in our literal) translation does not mean “black death”, but “plague”, i.e. again, it only indicates that the actions of the “silts” were “massive, like an epidemic of the plague. But the last one was

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just a disease, albeit a very serious one, that could be fought and conquered”⁵⁵.

Let us note, however, that the Soviet ground attack aviation was intended, after all, not to suppress the morale of the enemy, but to destroy his manpower and equipment. We also take into account that in the second half of 1943-1945. the number of IL-2 in the army fluctuated between 2400-4200 aircraft ?!. To evaluate these figures, let us recall that the Junkers L187 dive bombers - the main German "battlefield aircraft" - on the Soviet-German front in 1941-1944. there were approximately from 200 to 500²⁵², i.e. an order of magnitude smaller, and that this amount was nevertheless enough to inflict on the Soviet side, according to the unanimous assessment of the latter, "innumerable disasters"²³ of a completely material nature (for more details, see the chapter [At this edition) ... In 1944-1945 V. Schwabedissen repeatedly emphasizes, “the numerical superiority of the Soviet attack aviation gradually reached such proportions that Soviet ground attacks took place with its almost continuous support”? And yet, until the end of 1944, the “humpbacks” caused the enemy more moral damage than material damage!

Comparing these two values—the size of the aircraft fleet and the amount of material damage inflicted on the enemy—the combat work of Soviet attack aviation in the Great Patriotic War cannot be considered highly effective. In any case, the conclusion of another German front-line soldier, F. von Mellenthin, that “the effectiveness of Russian aviation did not correspond to its numbers” directly applies to it. And, of course, the actions of the IL-2 were not as effective as it was portrayed in Soviet literature (and is still often portrayed in modern Russian literature).

Why did the effectiveness of Soviet ground attack aircraft not correspond to its numbers? Already from what has been said above, it is clear that the effectiveness of IL-2 strikes was affected by:

a) the unsuitability of the material part of this attack aircraft for effective destruction of ground targets;

6) insufficiently effective tactics of the Soviet assault aviation;

c) insufficient training of Soviet pilots MOVIKOV AND

d) opposition to German fighter aircraft and anti-aircraft artillery.

Let us now consider each of these reasons for the insufficient effectiveness of the actions of Soviet attack aircraft (as well as others) in more detail.

2. HOW EFFICIENT IMPACT WAS THE IL-2 Sturmovik?

Now, after the publication of the studies of V.I. Perov and O.V. Rastrenin, it can already be stated with certainty that the famous IL-2 - which was and is considered by us to be the ideal "battlefield aircraft" of the Second World War - was not sufficiently adapted for effective destruction of ground targets. This statement looks all the more paradoxical because the IL-2 was praised not only by domestic authors; "From the point of view of many German commanders", it also "fulfilled all the requirements for an attack aircraft, and was often considered by them as an ideal combat weapon for attacks on small ground targets in the front line"⁵⁶. However, from the context in which this opinion is given, it is clear that it was not so much about a specific IL-2 machine, but about the Soviet concept of an attack aircraft - relatively slow, but well armored ... In addition, German officers did not fought on the IL-2 and could not know about many of its shortcomings by definition

laziness.

The imperfection of the IL-2 attack aircraft as a strike weapon was due not only to the imperfection of its

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weapons and equipment (which has already been discussed above and will be discussed in the future), but also by the shortcomings in the design of the aircraft itself - the weapon carrier. To begin with, it was not adapted to carry out dive attacks at an angle of more than 30 °. Contrary to the notions that were widespread in the literature until recently, the IL-2 could dive at an angle of 60 ° and even vertically, but it did not allow it to deliver an aimed strike at such a peak. In this mode, the meon became too difficult to pilot; besides, his glider did not have a sufficient margin of safety to confidently withstand the pressure of air at high speed developed in a steep dive. Already at a dive angle of about 40 °, the IL-2 began to "tremble slightly", and at angles close to 90 °, it simply "shaked". Therefore, although at least in the 312th assault air regiment of the 233rd assault air division they bombed from a dive at an angle of about 40 °, in the 621st assault air regiment

307th assault air division, even at an angle of 50 degrees, this practice is widely used
I could not.

Of course, one can hardly blame SV Ilyushin for this. After all, when designing the IL-2, he proceeded from the ideas generally accepted before the war in the USSR about the tactics of attack aircraft, according to which attack aircraft were supposed to attack from a strafing flight - i.e. with planning at a very slight angle. But, one way or another, the IL-2, unable to bomb from a steep dive, turned out to be unable to provide high accuracy of bombing (which, in particular, was distinguished by the main German "battlefield aircraft" - the dive bomber L187). After all, the greater the dive angle of the aircraft, the more the trajectory of the dropped bomb coincides with the line of sight ... It is no coincidence that when characterizing the Soviet attack aircraft during the war, the German General Staff officer E. Middeldorf first of all emphasized that she did not rely on "suppression or the destruction of individual objects with aimed fire", but for shooting and bombing "in areas"⁶⁹. That's why for inflicting the German howl

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the "significant damage" scams required the use of a very large number of IL-2s! "German aviation, on the contrary, diving from high altitudes, attacked individual "pinpoint" targets" ... ⁶!

Due to the inability to accurately attack from a steep dive, the IL-2 could not be successfully used against the main striking force of the Wehrmacht - tanks - and its most accurate weapon - guns. From 20-mm ShVAK and 23-mm VYA with their maximum armor penetration of 15 mm, for most German tanks in 1942 - the first half of 1943, it was possible to pierce either only the roof of the turret and the engine compartment (for R7Krÿ "PO"), or only the roof of the engine compartment (at R"KremPU)⁶². The defeat of the undercarriage by a ShVAK or VYa shell (in the 42nd attack aircraft began to enter tank columns not only from the front or back, but also from the side) did not cause significant harm to the tank. Even when destroyed by a rocket sloth and one track roller, it was noted in the reports of NIPAV, not only the medium R "Krÿm Sh, but also the light R" Krÿ \ P "retain the possibility of movement"⁶³. Thus, in order to destroy in 1942 - the first half of 1943 the German tank with cannon fire, the "humped" had to dive in. But to dive - so that the shells do not ricochet from horizontal armor plates - at an angle of at least 40 ° - not 25-30 °, as the pilots of the IL-2 had to ... (True , W. Schwabedissen points out that in 1942-1943 "Ils" fired at tanks, as a rule, from a steep dive⁶⁴ - however, Soviet sources do not confirm this. According to V.I. Perov and O.V. Rastrenin, typical

The method of conducting cannon fire (already from the more powerful NS-37) on a tank in Soviet attack aviation was still shooting from a dive at an angle of 30 degrees 6 ° even in 1943.)

As it is clear from the above words of E. Middeldorf, from the point of view of the Germans, not only bombing, but also a bullet

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cannon fire Il-2. In addition to the poor training of pilots, tactical miscalculations and imperfections in integral devices (all this will be discussed later), such a design flaw of the Il-2 aircraft as an excessively rear centering also affected here. Because of it, the "humpbacked" was distinguished by insufficient longitudinal stability. And this increased the dispersion of bullets and projectiles during firing, made aiming difficult, introducing lateral corrections into it, holding the line of sight of the target during firing - in a word, reduced the aiming (and, accordingly, the effectiveness) of the fire. Particularly unstable were the two-seat "silts" produced in late 1942 - early 1944: due to the installation of the cab, their centering arrow moved back even more. It was possible to improve the longitudinal stability of the Il-2 only in the spring of 1944, when aircraft with an increased sweep of the leading edge of the wing consoles began to arrive at the front. However, out of 24,959 two-seater Il-2s received by the Red Army Air Force in 1943–1945, only 11,066 had an "arrow" wing, i.e. 44.3% (and if we take into account only those received before May 9, 1945, then this percentage will be even lower). The veteran of the 820th Assault Aviation Regiment N.I. mm guns ShVAK (or 23 mm VYa) and two 7.62 mm machine guns ShKAS) were the most effective, as the war showed, guns. However, aimed fire from them was made difficult (in addition to all the above factors) by another design flaw of the Il-2 - the unsuccessful placement of weapons in the wing. The guns were installed in it at a greater distance from the axis of the aircraft than machine guns - and the farther from this axis, the stronger the wing vibrates in flight and the worse, therefore, the accuracy of the battle of wing weapons turns out to be, the greater the dispersion of bullets or shells becomes. . In addition, the farther the weapon is from the axis of the aircraft (i.e., the aiming line), the greater the aiming error.

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In general, S.V. Ilyushin's refusal to install guns in place of machine guns (i.e. closer to the axis of the aircraft), and machine guns in place of guns, reduced the effectiveness of the Il-2 cannon fire

(more, we repeat, effective than a machine gun!) by about one and a half times⁶⁸. True, aircraft plant No. 381 independently corrected this OKB miscalculation - but it built only 270 out of 36,154 Il-2 ... 69

Turning to the assessment of the effectiveness of the weapons and equipment of the Il-2, we emphasize first of all that throughout the war the "humpbacks" did not have more or less satisfactory aiming devices! As already noted, the PBP-16 sight, which was installed on attack aircraft in 1941, with the then generally accepted practice of strafing strikes, turned out to be practically useless - the target ran up and disappeared from view too quickly for the pilot to have time to use this rather complex device. Therefore, in the front-line units, the PBP-16, as a rule, was filmed and until the middle of 1942 they aimed ... by eye - firing a machine-gun burst at the target and turning the plane, depending on where the route lay (and dropping bombs according to the time delay). For bombing from level flight from heights of more than 50 m, in the fall of 1941, aiming marks began to be used, applied to the windshield of the cockpit lantern and the hood of the aircraft, but they also "were inconvenient to use", and most importantly, "did not provide the required bombing accuracy" ⁷⁰. And from the middle of 1942 - when attack aircraft began to practice strikes from a shallow dive and when the PBP-16 could come in handy - all Il-2 were supplied as a sight with a primitive mechanical VV-1 sight (consisting of ki-pin and crosshairs on the windshield of the lantern of the cab NY - "Bring the crosshair under the pin and throw it!"). that the accuracy of aiming with this sight was less than with

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using the collimator sight PBP-1672. "We drop bombs "by eye", according to our own sensations", "all intuitions", - frankly characterize the bombing from the Il 2, equipped with a VV-1 sight, who fought in 1943-1945. respectively, in the 312th assault air regiment of the 233rd assault air division and 21 of the 1st (then - the 154th guards) assault air regiment of the 307th assault air division N.I. Shtangeevi Yu.S. Afanasiev. Even such a "pinpoint" target as a steam locomotive, L.S. Dubrovsky, who fought in 1944 in the 566th assault aviation regiment of the 224th assault air division, had to be bombed "by eye" ... 73

When bombing from horizontal flight from heights of more than 50 m, at least in the 621st assault air regiment of the 307th assault air division, even in 1944-1945. used as a sight all the same sighting marks on the hood (as well as the hood itself - dropping bombs at the moment when the nose of the aircraft covered the target, and the landmark chosen in advance, away from the target, turned out to be in the alignment of the arcuate

different labels)...

The fact that bombing from the IL-2 continued to differ little from non-targeted bombing is evidenced by the frank admission of V.G. the attack aircraft did not have a bomber sight, but it seems to me that they did not need it. What is it for? There's no time to aim! The same applies to IR RS - they flew, they scared"? 4. It turns out that with his IL-2 bombs, and at the end of the war, the enemy was more frightened?

And the above assessment of German front-line officers, according to which "positive successes" in the fight against tanks "directly on the battlefield", even at the beginning of 1945, the "humpbacks" achieved only "from time to time", - this assessment will become clearer. , if we take into account the low efficiency of such a weapon installed on the IL-2 (and in every way extolled in Soviet literature) as the 37-mm NS-37 cannon. More precisely, the low efficiency of the system "IL-2 attack aircraft - two NS-37 guns" (about a thousand such "silts" would

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lo issued in April 1943 - January 1944 specifically to fight German tanks).

By themselves, the armor-piercing incendiary shells of the NS-37 cannon from a distance of up to 500 m could penetrate any armor plates of the Marder P, Marder Sh and Ves ne self-propelled artillery guns then common in the Wehrmacht, and when firing from planning at an angle 5-10 ° - and 30-mm side and rear sheets of medium tanks R7Krÿm Sh and R "Kremu and self-propelled guns \$ 1040, ZaSTU and] 4R? 7 [U / 70. In addition, they disabled any German tank or self-propelled gun by hitting the undercarriage, causing significant damage to the latter">. However, the probability of hitting the tank from the NS-37 was very small. When firing in the usual front-line method - from a dive at an angle of 30 ° from a distance of 300-400 m - according to the RKRMMU, even for a well-trained pilot, it did not exceed 4-79%76 - so that for a guaranteed defeat of one tank it was necessary to send 15-25 IL -2 (and with medium or poorly trained pilots - even more) ... The fact is that the powerful NS-37 had a very large recoil force ("when you open fire, the feeling that the plane stops", after firing "the whole plane began to breathe, blabbed"""). Because of this, the firing aircraft made "pecks" in the vertical plane, and since the two cannons suspended under the wing fired out of sync, the recoil force of each of them also alternately turned the aircraft to the right, then to the left. The aiming, of course, was lost, and it was possible to avoid the need to aim again during the attack only by firing in short bursts - 2-3 shells each. But this also reduced the chance of hitting, and the dispersion of shells

still too big. (When firing from one cannon, after the very first shot, the aircraft turned in the direction of this gun so much that the pilot did not have time to aim again until the very exit from the attack.) Let us add that it was generally not easy to aim at the "silt" from the NS-37 : installation under the wing of two heavy guns in massive fairings led to a large spread of masses along the span

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wings, and this made the "anti-tank" Ilyushin very difficult to pilot. In general, with the poor training of the majority of Soviet attack pilots (0 see it in the fourth section of this chapter), the IL-2 with the NS-37 turned out to be ineffective as an anti-tank weapon - which is why the decision of the State Defense Committee of November 12, 1943 was out of production.

In the fight against German tanks on the battlefield, the IL-2 132-mm high-explosive fragmentation projectiles ROFS-132, introduced in 1943, could not help; self-propelled guns - even with a gap of 3 m from the vehicle!), and most importantly, they ensured greater accuracy of fire compared to the RS-132. "Already in the second half of 1943, the battle formations of German tank units became so dispersed that even with increased accuracy the effectiveness of the use of "eres owls" against tanks remained unsatisfactory ... 9

The effectiveness of such anti-tank weapons Il-2 as the 1.5-2.5 kg cumulative anti-tank bombs PTAB-2.5-1.5 that appeared in the summer of 1943 was somewhat exaggerated in Soviet literature. True, the Soviet designers this time turned out to be beyond praise. One hit of the PTAB-2.5-1.5 was enough to disable (in most cases irretrievably) any German tank or self-propelled gun - and from 192 to 220 such bombs could fit on the attack aircraft. When they were dropped from level flight at a speed of 340-360 km/h from a height of 200 m, one PTABZ0 fell into every 15 square meters of a strip 190-210 m long and 15 m wide. And since the most common in 1943-1945. in the Wehrmacht, the medium tanks R7KREMU Ats \$ ý.S, Ni /] and the heavy R7 Krÿ No U "Panther" occupied an area of about 17 and about 23 square meters, respectively, one Il-2 water run was guaranteed to destroy the PTA Bami all vehicles of these types that turned out to be within the indicated band! And in the early days of the Battle of Kursk - when would cumulative bombs be used for the first time - effectively

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The rate of IL-2 strikes on tanks has indeed increased significantly. So, on July 7, 1943, two strikes of 79 aircraft of the 1st

of the attack air corps of the 2nd Air Army of the Voronezh Front on the accumulation of equipment of the SS motorized infantry division "Totenkopf" in the Syrtsevo-Yakovlevo area (on the southern face of the Kursk Bulge) led - as the decoding of photographs of the battlefield showed on the same day - to the defeat of more than 200 tanks, self-propelled guns and armored personnel carriers². This figure, apparently, is still overestimated³, but the recognition of F. von Mellentin, who then headed the headquarters of the 48th tank attacking on the southern face of the Kursk Wehrmacht Corps. On July 5, 1943, he points out, in the motorized infantry division "Grossdeutschland" "many tanks fell victim to Soviet aviation"⁴; this was apparently the work of the 291st Assault Air Division of the 2nd Air Army, whose Il-2s also used HEAT bombs. It is no coincidence that already a few days after the start of the Battle of Kursk, non-German tankers switched to much more dispersed marching and pre-battle formations ...

But it was these new battle formations of the German tank troops that were lowered - literally at the very beginning! - the effectiveness of the use of "humped" PTABs is immediately 4-4.5 times - so that it became only 2-3 times higher than when high-explosive bombs were used against tanks. And in the parking lots, German tankers began to place their vehicles under trees, light mesh canopies and install light metal meshes above the roof of the turret and hull. The overly sensitive PTAB fuse worked already when it came into contact with branches and nets, the cumulative jet hit into the void - and the tank remained unharmed ... determine more or less accurately - after examining the area of \u200b\u200btheir operations) showed that even when using PTABs for the guaranteed destruction of one German tank after the first days of the Battle of Kursk, it was already necessary to allocate from 18 to 30 guns

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movikov⁶. And since the usual number of IL-2 groups flying out on a combat mission in the second half of 1943-1945. did not exceed 12-36 aircraft (and only sometimes reached 50-60)⁷, then the average statistical result of one hit by "humped" on German tanks and at the end of the war should not have exceeded 1-2 armored units destroyed.

The effectiveness of the strikes of the IL-2 was also affected by its insignificant bomb load - the normal value of which was only 400 kg. It, as a rule, also turned out to be the maximum: theoretically, this latter was equal to 600 kg, but only experienced pilots could take off the car with such a load from the ground, and they (as we will see below) were not enough in Soviet attack aviation. In addition, many - poorly manufactured or worn out - aircraft could not lift 600 kg of bombs in principle.

ziper. "We took 400 kg of bombs," testifies who fought in 1944-1945. in the 15th Guards Assault Aviation Regiment of the 277th Assault Air Division V.G.Averyanov - rarely 600 kg - did not take off ... \!190) could not lift bombs with a caliber over 250 kg.

In general, the composition of the IL-2 armament "did not ensure the effective destruction of typical targets, mainly armored vehicles."

Until 1943-1944 The effectiveness of the IL-2 was also reduced by such a problem, common to all Soviet Air Forces, as the lack of reliable radio equipment. Until 1943, radio stations were installed only on command vehicles, so that if "the leader's plane was shot down or damaged, the entire link remained without communication" with the ground ... Yes, and "it was inconvenient to use the radios" ?!. "Aircraft radio stations," explains the former pilot of the 504th assault aviation regiment, I.I. But after all, the pilot is not on the ground, but in the air, he needs to pilot the plane. And at the same time

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the radio control panel was located on the right side of the cockpit, and the plane had to be controlled with the left hand. In addition, the radio stations gave a lot of interference during operation (mainly due to the lack of effective metallization on the aircraft), "and the voice of the subscriber was not clearly audible" ... earth. As a result, the attacks of the "silts" were often late; not receiving information from the ground about the outline of the front line of their troops, the pilots were afraid to strike near the line of contact, i.e. where their support was most needed! (The situation was aggravated by the fact that the Soviet infantry throughout the war, as a rule, was extremely reluctant to mark its front line with rockets, tracer bullets, white sheets or colored smoke, as they were afraid to unmask themselves from the air and be attacked by German aircraft. Meanwhile, the latter was oriented along the front line not of the Soviet, but of its own troops - clearly marked by missiles? ".)

Only from 1943-1944. - when the quality of radio communications gradually improved, and radio stations appeared on each attack aircraft, it became possible to effectively direct the "humpbacks" at the target on the commands of the guidance officer located at the location of the ground troops. Thanks to this (as well as the gradual debugging of the work of guidance stations), the interaction of attack aircraft with infantry and tanks in 1944-1945. improved significantly.

3. HOW EFFECTIVE WAS THE IL-2 TACTICS?

We turn, therefore, to an analysis of the tactics of the IL-2. In 1941-1943. the effectiveness of the actions of the "humpbacked" was affected, in particular, by such a tactical miscalculation as striking with small forces. If the German L187 lancers often operated in groups of 20-40 vehicles, then the IL-2 most often flew to combat missions

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trios (in 1941-1942), fours, sixes, eights ... The small number of aircraft in the group not only increased the chances of German fighters attacking it (which in the end could completely disrupt the strike), but also significantly reduced the likelihood of hitting the target (let's not forget about the already low accuracy of the IL-2 fire). As theoretical estimates show, in 1941-1942. a group of 6-8 "silts" "could not be guaranteed to suppress even one typical target on the battlefield in one sortie"? And, for example, in the 15th Air Army of the Bryansk Front, six troopers (and even in pairs!) "Hunchbacks" also worked in July 1943, at the beginning of the Oryol operation. True, the command tried to massage the blows of these pairs and sixes on a narrow section of the front - but this only led to the mixing of groups over the target and complete confusion ...

Only in the second half of 1943 did they begin to practice striking in large groups - 12-36, atoi 50-60 IL-2. True, at the same time such a number of "humpbacked" rarely worked on the target. In particular, from the documents of the 900th Fighter Aviation Regiment, it can be seen that from June 22 to October 16, 1944, its "yaks" escorted 249 IL-2 groups of the 1st Air Army of the 3rd Belorussian Front to combat missions with a total strength of 1515 aircraft; in January 1945 - 103 groups (792 IL-2), in February - 182 (plus 12 IL-2 groups for reconnaissance; 978 aircraft in total), in March - 108 groups (1008 IL-2)⁹⁶. Consequently, the average number of attack aircraft in a group was, respectively, 6, 8, 4-8-10. But these fours, sixes and eights now flew out one after another, ensuring the continuity of the impact on the target - and, consequently, increasing the probability of its destruction.

In 1941-1942. (and partly later) the allocation of too small forces for the strike was aggravated by the short time of impact on the target. In 1941, attack pilots, as a rule, made only one approach to the target; two or more were carried out only if there was no (or was too weak) opposition from anti-aircraft artillery. In November 1941, in mixed strike groups of the Western Air Force

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the front for the first time began to allocate part of the forces to suppress anti-aircraft guns; the disorganization of the enemy's air defense, carried out by one part of the group, allowed the other to make several visits. However, this practice could not take root for more than a year. "The attack of targets is carried out, as a rule, from one approach," stated, for example, on June 2, 1942, "summing up the work of the Il-2 in the May battle near Kharkov, the commander of the Air Force of the Southwestern Front F.Ya. in one gulp [...]»7. In the summer of 1942, in the assault air regiments of the 8th Air Army operating in the Stalingrad direction, they also began to practice the suppression of German anti-aircraft guns by part of the forces - however, in the August battles on the near approaches to Stalingrad, the "silty" of this and the 16th Air Army were still carried out just one hit on the target! They acted in the same way during the Soviet counter-offensive near Stalingrad in November 1942-February 1943; the pilots of the 1st assault air corps acted in the same way at the tactical flight exercises near Moscow on October 4, 1942 - this was a common phenomenon ...

In addition to the too short impact time on the target, an attack in one go also meant the refusal to use part of the Il-2 weapon. It was impossible in principle to use cannons, machine guns, and rockets at the same time - after all, when opening fire on a dive at an angle of 30 ° from a distance of, say, 1200 m, the aiming point for launching "eres" had to be moved forward from the target by 10 m, for firing from VYa cannons - by 13, for firing from ShKAS machine guns - by 35, and for firing from ShVAK cannons - by 40 m9. Experienced pilots could still, having quickly fired from one type of weapon, quickly correct aiming and even before leaving the attack, open fire from the second - but the effectiveness of using this second was reduced (depending on its type) by 20-70% 109. It was hardly possible to avoid haste with aiming (and, therefore, reducing the effectiveness of a bombing strike) even when using any one type of small arms and artillery weapons and air bombs in one run.

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In 1943-1945. this vice has been largely eradicated. On targets lacking strong anti-aircraft artillery cover, IL-2s began to make up to 4-6 visits, some of the leading groups organized seven or seven. A group of senior lieutenant N.I. Purgin from the 820th assault aviation regiment of the 292nd assault aviation division of the 2nd air army of the 1st Ukrainian Front in October 1944, during the Carpathian-Dukla operation, once made even 15 visits, and stormed in the same month, during the Moonsund operation, the German positions on the island of Dago (Kiiumaa) the link of senior lieutenant V.I. !); January 18, 1945, at the beginning of the East Prussian operation

walkie-talkies, the group of Major M.T. Stepanishchev from the 76th Guards Assault Aviation Regiment of the 1st Guards Assault Air Division of the 1st Air Army of the 3rd Belorussian Front did the same! However, the average number of visits to the target of IL-2 in 1943 did not exceed three. So, in the 277th assault air division of the 13th air army of the Leningrad Front in January of this year it was 2-3; in the 5th Air Army of the North Caucasian Front in March 1943 - 2-4; in the 8th Air Army of the Southern Front in December - 1-4¹⁹². And even on April 23, 1945, during the Moravian-Ostrava operation, separate groups of the 8th assault air corps of the 8th air army of the 4th Ukrainian front were limited to just one approach¹⁹³. |

The effectiveness of the IL-2 was also reduced by the tactically illiterate execution of the attacks themselves - especially in 1941-1942. The latter turns out to be quite natural, given that up until the end of 1942, attack aviation did not have any instructions for the combat use of the IL-2. "[...] In our regiment [504th Assault. - A.S.] and in the division [226th assault. — A.S.], — testifies, in particular, I.I.

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niya. [...] It was the fault of the Air Force combat training service. [...] We had to solve a lot of particular questions and fundamental problems of tactics on our own. Firstly, how to build battle formations of units, squadrons and regiments? [...] Secondly, how and from what heights can one most successfully attack the target, in what sequence to use the entire arsenal of weapons, how to maneuver before reaching the target and when leaving it?"¹⁰⁴

As a result, in 1941 and early 1942, IL-2s bombed and fired at targets almost exclusively from a strafing flight, i.e. from gliding at an angle of 5-10°, but not from diving at an angle of 25-30°, which ensures greater accuracy of shooting and bombing. In a strafing attack, when the "silts" swept over the target in almost level flight at a height of only 5-25 m, the target disappeared from the pilot's field of vision too quickly for him to have time to properly aim. Careful aiming here was also hampered by the fact that at ultra-low altitude the attention of the pilot (and especially the poorly trained one - which was the majority in the Soviet Air Force) was mainly focused on controlling the aircraft - otherwise it was possible to crash into the ground ... And the probability of being hit from low altitude the flight of a "point" object was also reduced by the increased dispersion of bullets and shells compared to diving from a dive. As field tests showed, when firing from two ShVAK cannons from a dive at an angle of 30 °, the dispersion ellipse was obtained with axes of 5, 2 and 4 m, and when firing from planning at an angle of 5 ° - with axes already 14 and 8 m! ⁰⁵. Nako-

bombs dropped from an ultra-low altitude, as already noted, often ricocheted and exploded away from the target ... However, before the war, "all talk about ground attack aviation came down to low-level flight - flight at ultra-low altitude" ... 106

Apparently, the pilots of the 66th assault air regiment of the Air Force of the Reserve Front were the first to realize the unproductivity of such attacks, who already at the end of July 1941 switched to attacks from a dive from medium altitudes. However, this method has become widespread

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to from the end of the spring of the 42nd. And only in September 1942, the People's Commissariat of Defense finally issued the "Instructions for the combat use of the Il-2 aircraft", which legalized dive attacks from medium heights; in October, the draft "Guidelines for the Combat Actions of Attack Aviation" appeared, which also took into account the experience of the war.

However, strafing fire and bombing were continued in many assault aviation units and formations well into 1943-1945. The former chief of staff of the 48th tank corps of the Wehrmacht, F. von Mellenthin, who fought on the Soviet-German front in December 1942-September 1944, even claims that the IL-2 during this period was "mainly" attacked in this way!¹⁰⁹⁷ V Shvabedissen also points out that back in 1943, attacks on targets on the battlefield (and not columns on the march and not concentrations of troops, against which the low-level one was effective. - A.S.) by Soviet attack aircraft "were carried out from a strafing flight" ...¹⁰⁸

Thus, even at the end of the war, Soviet attack aviation often used tactics that made Il-2 strikes low-aimed and, therefore, ineffective (compared to dive attacks, it reduced the effectiveness of Il-2 strikes by about 2-2.5 times ¹⁰⁹).

The blame for this tactically illiterate use of Il-2 aircraft should be largely, if not entirely, placed on the Soviet air command. Thus, the highest command and staff authorities of the Soviet Air Force, having since the autumn of 1942 advanced tactical instructions for ground attack aircraft, clearly did not care enough about introducing them into combat units. As a result, for example, in the 233rd assault air division of the 1st air army of the Western Front there were no tactical instructions even in the spring of 1943! The leaders of the groups, A.N. Efimov, a veteran of this formation, testifies, were still guided only by their own experience, so that "spectacular methods of combat work are not always

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were adopted by all pilots. Some continued to argue for the benefits of strafing! 19.

As early as October 15, 1942, the "Instructions on the combat use of the Il-2 attack aircraft" were put into effect in the 8th Air Army, which provided for strikes from a dive! And yet, even a year later, in October 1943, during the Melitopol operation, six Guards Lieutenant N.I. strafing artillery batteries! "The calculation turned out to be correct," writes the author of an apologetic essay about Semeyko. "The anti-aircraft gunners did not have time to open fire on low-flying attack aircraft." Indeed, a large angular displacement of a low-flying target should have complicated the air defense operations, however, it is hard to believe that the "bullets and shells" fired from a low-flying target hit the target!12. It would be more expedient to neutralize the anti-aircraft guns in another way - to allocate two attack aircraft to suppress them, with the forces of the remaining four to attack the batteries aimingly, diving at them from medium heights. The optimality of this method of action of the six IL-2 when hitting a target covered by anti-aircraft fire in the 8th Air Force was revealed back in the summer of 1942! At the same time, by a directive of August 22, 1942, the commander of the Red Army Air Force also demanded to allocate part of the group's forces to suppress anti-aircraft artillery and strike from a dive ... However, many did not take into account either this experience, or even the "Instructions" not only in the fall of the 43rd, but also in the spring of the 45th ... As early as April 23 and 26, 1945, during the Moravian-Ostrava operation, the commander of the 4th Ukrainian Front A.I. Eremenko noted in his diary that many pilots of the 8th attack air corps of the 8th air corps "As before, they bomb and shoot without diving, and launch eres from level flight [...]"113.

It is possible, however, that the instructions did reach the combat units, but there, in the units, they were ignored. And that, consequently, both the lower command and

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headquarters units, those who directly planned and led the strikes of the "humpbacked" - the commanders and headquarters of the regiments and (or) the leaders of the groups. A number of facts allow us to assume this way, testifying to the frank lack of professionalism of the majority of commanders of these levels. So, it is in the shelves - and in a considerable number of them! - in the spring - in the summer of 1942, "silts" were released on combat missions without bombs or with an incomplete bomb load! First, the order of the People's Commissar of Defense No. 0490 dated June 17, 1942, and then the directive of the commander of the Red Army Air Force dated August 22, demanding "immediately put an end to the harmful practice of underestimating the Il-2 aircraft as day bombers and ensure that no

one Il-2 aircraft did not fly into battle without a full combat load! 14. It is impossible not to recall those truly amazing lack of professionalism and negligence, which back in 1943 were demonstrated by commanders in the regiment and below when planning sorties.

Poor planning and poor combat support of strikes should be singled out as another major tactical flaw in Soviet attack aviation, which was inherent in it until the end of 1943. How unsatisfactory things were here on the eve of the Battle of Kursk, shows, in particular, the directive of the commander of the Red Army Air Force A.A. Novikov dated July 7, 1943, in which the results of the work of Soviet aviation in March - June of the 43rd were summed up. Two years of war have already passed, and the suppression of anti-aircraft artillery covering the object of attack is still "far from always carried out and usually has a random character. As a result, attack aircraft [...] suffer losses, and the effectiveness of their actions is reduced." "Aerial reconnaissance of objects before a strike is not carried out, attack aircraft [...] usually operate on unexplored targets, not knowing the location of the object, its nature, and especially air defense systems. Hence the frequent cases of missing the target or meeting with unexpectedly strong opposition from anti-aircraft weapons and enemy fighter aircraft, ie. again, a decrease in the effectiveness of strikes. (According to the report for

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Deputy Supreme Commander-in-Chief G.K. Zhukov and Chief of Staff of the Red Army Air Force S.A. Khudyakov I.V. The air armies of the Voronezh, 5th - Steppe and 17th - South-Western Fronts were also demonstrated during the Battle of Kursk.) In general, when deciding to take off the group, the commanders did not want to take into account the situation on the route and in the target area! As a result, the directive of July 7 stated, "Our ground attack aviation [...] is used mainly according to a template. The same methods of attack, heights, battle formations, routes, approaches and withdrawals in one direction are systematically repeated. "Such actions are easily foreseen by the enemy and lead to frequent disruptions in the execution of the task"!15. In fact, knowing in advance where they would come from, where they would end up and what the IL-2 would do, the German anti-aircraft gunners quickly discovered them and quickly took aim; German fighters made the decision to attack faster - and many "silts" simply did not have time to hit the target ...

And often, at least until the spring of 1943, attack aviation commanders did not consider it necessary at all to plan (even according to a template!) a sortie, to work out in detail with each crew its specific actions on the route, when attacking a target and returning! In 1941, the refusal to conduct pre-flight training - in

during which the pilots had to understand in detail the route with all its landmarks, the direction of approaching the target and exiting the attack, the method of attacking the target, the sequence of using various types of weapons, options for actions when meeting with anti-aircraft fire and enemy fighters, the procedure for avoiding the target and so on. - in the assault regiments was generally the norm. As a result, pilots often disrupted the fulfillment of a combat mission already because of the loss of orientation alone ... Even during the Kharkov battle in May 1942, in the assault air units of the Air Force of the Southwestern Front, the commanders set tasks for the crews

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"indistinct, vague"; pre-flight preparation was not organized again. Approximately the same way - without a detailed study of "the task set, the route, the nature of the target and the tactical situation" - the crews of the "humpbacked" 8th Air Army of the Stalingrad Front were released on combat missions during the Soviet counteroffensive near Stalingrad in November 1942 - th - February 1943! 6. Judging by the memoirs of A.N. Efimov, things were about the same in late 1942 - early 1943 in the 198th assault aviation regiment of the 233rd assault air division | th air army of the Western Front. For example, before Efimov's first sortie (November 30, 1942), the leader of the four, Lieutenant A.N. Vasiliev, specified only the route, the order of takeoff and formation of the group; the questions of the distribution of the forces of the group when hitting the target, the procedure for using various types of weapons and the way out of the attack remained unclear ... When Efimov, appointed as the flight commander, began to carefully plan the actions of his group on the target before the flight, this was perceived in the regiment as something strange. «[...] Over our link, - recalls Efimov, - they laughed [...] they began to call them academicians" - and only then, "gradually", "such advance preparation for sorties was introduced in other units and squadrons" ...!17

True, W. Schwabedissen, in the section of his work devoted to 1942-1943, cites the assertions of German front-line experts that "good reconnaissance of targets" preceded the Il-2 strikes, that the crews of Soviet attack aircraft "received good instruction", and the strikes were carried out "at different times, from different heights and directions and by different formations of groups of aircraft"!18. But, apparently, these estimates refer only to the end of 1943, and once again we are faced with the poor editing of Schwabedissen's work. "Over time," we read in the section devoted to 1944-1945, "Soviet attack aircraft made progress in using various factors to skillfully approach the target and detect it.

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niya!19. It turns out that before the 44th IL-2, they still acted here not quite skillfully?

Only from the middle of 1943, O.V. Rastrenin confirms our assumption, "a radical change begins in the minds of the command staff at all levels", the assertion of Soviet commanders in the idea that "it is necessary to fight correctly, the troops must be controlled and through this it is realistic influence the outcome of the battle, that not only the pilots must shoot and bomb well, but also the staffs must organize and ensure their actions well! They began to improve the skills of staff officers purposefully, persistently and based on combat experience (the study of which, in turn, was also sharply increased).

But if things gradually improved with the planning and combat support of Soviet attack aviation strikes on the battlefield, then the actions of the IL-2 against objects located in the German rear - airfields, communication lines, reserves on the march, etc. - this hard to say. As early as 1944-1945, W. Schwabedissen notes, "obvious shortcomings in the planning of these operations significantly reduced their effectiveness"...121

For a long time, the Soviet aviation command was not able to organize effective interaction of the "humpbacked" with the ground forces - for direct aviation support, which, in fact, attack aircraft were intended for. The main stumbling block here was the organization of communications between the combined arms and aviation headquarters, which did not allow timely satisfaction of requests from combined arms for air support. And the main vices of this organization for a long time remained the almost complete absence of radio communications (the neglect of which was a long-standing disease of the Red Army) and the absence of a direct connection between the headquarters, say, of a rifle division and the headquarters (or command post) of an aviation division - because of which the application for an airstrike on was ruled by authority - first to the army headquarters, from there to

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the headquarters of the front, then to the headquarters of the air force of the front or (from the second half of 1942 - the air army) and from there - to the headquarters or to the command post of the air division. In 1941, for example, it took 8-12 hours for an application to pass through the authorities, and "applications were carried out when there was no longer any need for an air strike"122. It was exactly the same in July 1943, at the beginning of the Battle of Kursk...

Only in the middle of 1943, in the areas of the command post of the combined arms commanders, they began to deploy aviation command posts - which had a direct connection with the combined arms headquarters, in whose interests the IL-2 ground attack aircraft worked in the air, and on the front line - guidance points (they are also stations), who helped the attack aircraft inflicted

ti accurate strike and not hurt your troops. Also, say, in the Oryol operation (July-August 1943), such points were not available everywhere where required, and the leaders of the groups, out of habit, strove to work independently, without maintaining contact with aircraft controllers. But in 1944-1945. the interaction of the IL-2 with the ground forces had already been adjusted. "Flying up to the front line," recalls, for example, Yu. , - contacted the gunner, usually a representative of the air division. We already knew him by voice. He pointed us literally: "Guys, a little more, to the right. Yeah. Can". [...] The gunner from the guidance point constantly corrects our approaches to the target, tells us where to hit, warns about the appearance of fighters! Aviators have already learned how to quickly respond to changes in the ground situation. Here, for example, is the flight of six of the 3565th assault air regiment of the 224th assault air division of the 8th air army of the 4th Ukrainian Front to the area of the Russian Pass on October 7, 1944, during the East Carpathian operation. "When approaching Tsisna from the north," recalls M.Ya. Romanov, who led this group, "where the aviation command post was located at that time, I asked permission to launch an assault strike on a given target.

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In response, I hear on the radio: "Motor-3", I forbid striking this target. Take a heading of 212 degrees and fly at the disposal of "Bullets-1". I replied that I understood and that I was going to the disposal of Puli-1. A few minutes later, "Bullet-1" requested me and began to point at the target: "Go straight ahead. Turn left 90 degrees. Enough. The goal is in front of you. The edge of the forest on the top of the mountain. From there they shoot hard at our infantry. Attack!"²⁴ Following the example of the Luftwaffe, advanced air guidance groups began to be assigned, advancing in the battle formations of the ground troops...

As for the reasons for the low professionalism that was demonstrated for so long and often by the commanders of Soviet attack aviation and determined its tactical backwardness for so long, then - as in the case of fighter aviation - we must not forget about the too low level of general education, which distinguished in pre-war and war years, most commanders of the Red Army. After all, the essence of command work in war lies in the analysis of the constantly changing combat situation and the adoption of a decision appropriate to the situation - in other words, in the constant tension of thought. Namely, systematic general education (as we already noted in the first part of this publication) forms a person's habit of such tension of thought, for mental work, teaches them to comprehend continuously received new information in order to use it in their own interests ... Low level of general education

naturally should have given rise to the inability and unwillingness to strain one's thought. Hence V.I. Perov and O.V. Rastrenin's "lack of skills in working with information, the ability to classify information and combat missions into important and secondary ones, in accordance with the current ground-based and the air situation"²⁵, and the desire of the commanders of the Soviet attack aircraft to plan sorties according to the template, and

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the decision not to plan them at all, and that outright anti-intellectualism described by A.N. Ki - also requiring intellectual effort - in such an environment could only be carried out with great difficulty.

4. TRAINING LEVEL OF IL-2 PILOTS

The effectiveness of the strikes of Soviet attack aircraft was further reduced by the poor training of ordinary pilots. We have already seen how in 1941 it deprived the Il-2 even of those few chances for a successful fight against German tanks that this aircraft then had - how the pilots increased the number of misses by aiming not at a specific tank in the convoy, and on the "column in general", how did they open fire from excessively large distances - which reduced the already insignificant probability of hitting the tank with an "eres" and excluded defeat from the ShVAK and VYa cannons even from the only light tanks "accessible" to their shells ... Throughout the entire Battle of Stalingrad (July 1942-February 1943), attack pilots of the 8th and 16th air armies participating in it opened machine gun and cannon fire without additional search for targets, generally "without a detailed view of the target", without the choice of "the most advantageous aiming points" - in a word, thoughtlessly. As a result, the commander of the 8th Air Force T.T. Khryukin noted in his directive of March 7, 1943, that already destroyed tanks, armored tires, etc. — and also struck at their own troops²⁶. Only the poor training of pilots can explain the glaring cases of ignorance of the main properties of their weapons - when, during the counteroffensive near Stalingrad, the attack aircraft of the 8th Air Force fired at R2KremSh tanks and \$ 1040 self-propelled guns, not only from ShVAK guns that were ineffective against these machines, but also from 7.62mm pu

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Lemetov ShKAS!¹²⁷ Things were a little better then in

1st assault air corps. During the tactical flight exercises conducted in it on October 4, 1942, "the insufficient ability of the flight personnel to use small arms, cannon, rocket and bomb weapons against a ground target, the wrong choice of the direction of approach when attacking a target", "increased (up to 600 -800 m) range of opening fire from small arms and cannon weapons "...128

The poor training of the pilots turned out to be the main reason for the ineffectiveness of the IL-2 strikes with NS-37 cannons on German tanks during the Korsun-Shevchenkivskyi operation in February 1944. Being forced to attack from low altitudes due to low clouds, the Soviet pilots had time to exit from a dive, fire only 2-3 shells at the tank, which were not enough to hit this "pinpoint" target!29. German pilots who flew aircraft of a similar purpose L187S - just as difficult in PI

Locating because of the suspension under the wing of two 37-mm cannons - attacked Soviet tanks from a gentle (at an angle of 10-15 °) planning. This made it possible to fire at a "point" target for longer: in fact, it was possible to bring the aircraft into level flight faster than when attacking from a dive at an angle of 30°. But Soviet pilots lacked the training to fire at tanks from flat gliding: after all, flat gliding meant flying at ultra-low altitude, dangerously close to the ground. In this situation, a poorly trained pilot - and even more so on a plane that is difficult to pilot - turns out, as already noted, to be completely absorbed in controlling the machine and is no longer able to carefully aim ...

The great importance of pilot training for the effectiveness of IL-2 operations is also evidenced by the results of field tests conducted in July 1942. If a pilot with excellent flying and shooting skills, when bombing from a dive at an angle of 30° 100 m long and 20 m wide, with a probability that the other three - with good and mediocre training 12.4% - were able to provide here (of course, with other

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equal conditions) the probability is only 4.6%130, i.e. as a minimum 2.5 times smaller ...

The poor training of the flight personnel of Soviet attack aviation is not surprising: after all, the training of pilots in it, as in other branches of aviation, was carried out hastily throughout the war. So, in 1941, the average flight time of an attack aircraft pilot on the IL-2 before the start of his combat work on this machine was only 3-4 hours. In other words, during his training, he managed to make several flights in a circle on the "silt", two or three flights to the zone (that is, along a certain route), two or three for group flying and two or three for shooting and bombing! 31. True, in the 41st, most of those who mastered the IL-2 had already managed to serve as combatant pilots, master, fly, and even fight against those close to their intended purpose.

aircraft Su-2, R-5, R-Zet and others. But not much (or even menypuyu) training was received during the war years and beginners In aviation - cadets of flight schools! "To our regiment [47th Assault, 11th Assault Air Division of the Air Force of the Black Sea Fleet. - A.S.], - recalls, for example, I.G. Borisov, - very young pilots came with very little experience in the summer. They completed the accelerated training course in 6-8 months and were sent to the front. [...] They didn't teach flying in formation in school, bombing and shooting were given to a limited extent!"³². In the summer of 1942, young people who had only 3 to 20 (on average 13) hours of flight time on the Il-2, or even had never flown on it at all, studied on old-type aircraft!¹³³ The newly formed 672nd and 951st assault air regiments in the 9th mixed air corps arrived in the spring of 1943 with an average summer pilot on the Il-2 no more than 6-8 hours (and with 8 pilots who they didn't know how to fly this plane at all; however, the corps did not accept such regiments)! ³⁴. N.I. Shtangeev and two of his comrades, released from the school in April 1943, in the 312th assault aviation regiment of the 233rd assault air division | [th air army of the Western Front ended up flying on the Il-2 for 3 hours 16 minutes (true , in the flight books they were given 18 hours) and never flew not only in the ranks

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groups, but even in pairs!³⁵ Even in 1944, the average flying time on the Il-2 of a young attack pilot arriving at the front was only 20-26 hours!³⁶.

A truly monstrous picture of the criminal attitude towards the preparation of replenishment for the front! In fact, the newly "trained" Il-2 pilots could not cause any real damage to the enemy - for not only were they not taught how to use their weapons effectively, but they could not even fly as part of a group to the target! After all, just in order to learn how to stay in the ranks of the group (and not on the IL-2, but on the low-speed and stable R-5!), It was necessary to fly at least 50 hours ("fly in the ranks in constant tension, maintain the interval and distance very difficult")!¹³⁷. Many did not have time to master even the most elementary piloting skills; Thus, in 1944, young pilots came to the 198th assault air regiment who did not know how not only to fly in formation, but also, in essence, to fly an aircraft - they simply did not know how to operate the rudders in order to perform one or another maneuver...! ³⁸ But, as A.N. Efimov recalls, it is possible to use airborne weapons effectively only by those "who are fluent in piloting techniques. This is an axiom!"³⁹.

In fact, a pilot with little command of the machine has to devote most of his attention to monitoring instrument readings, maintaining his place in the formation of the group, and so on, rather than orienting and searching for targets. And this despite the fact that the latter was already an incredibly difficult task for him: yesterday's cadet saw below "a lot of diverse

moving and stationary objects of various sizes and contrast in the reflections from bomb explosions, flashes from artillery and mortar fire. Columns of dust and smoke clouded the area, making it difficult for the pilot to navigate and search for already well-camouflaged targets. since the end of 1942, it has become more difficult in this respect. The increased inertia and longitudinal instability of the double "silt" makes it difficult

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whether for an inexperienced pilot both to keep his place in the ranks of the group, and to perform a coordinated deep turn - and, therefore, to deliver strikes from the generally accepted in 1943-1945. combat formation "circle of aircraft". The latter, however, was often beyond the power of an undertrained pilot. After all, IL-2s flew most often in sixes, and the radius of the "circle" formed by only six aircraft turned out to be quite small. In order to fly in such a circle, the pilot had to give the car a large bank angle and, therefore, experience large g-forces, which could only be sustained with "good training"⁴¹.

Let us note that 13-26 flight hours is the result of passing not only a flight school course, but also a combat training course in a reserve aviation regiment. The organization of the training of ground attack pilots in spare parts—as it was in the summer of 1942—again, can only be called criminal. Due to the concentration of several regiments in training at one airfield, each of them could fly only half a day a week. And for these half-days, only 2-3 IL-2s or training IL-2Us were at the disposal of 20 pilots! (Only in a few cases did the regiments that were training have all their regular materiel at their disposal.) "As a result, the youth of the assault aviation regiments, being in formation in the 1st Zab [reserve air brigade. - A.S.], usually managed to complete only the 1st section of the combat training program (performing individual piloting techniques), and the 2nd section (performing group flights as part of a flight and squadron and combat use) - only 42. Moreover, even before they had time to acquire these insufficient skills, many young pilots immediately lost them, because they were sent for 2-4 months ... to harvest the crops in the collective farms of the Kuibyshev region! But, as the then head of the Red Army Air Force, Ya.I. Alksnis, noted back in 1937, after a three-month break in flying, the pilot must again be sent to the flight school ...⁴³ Truly, such a system for training attack pilots can be characterized

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We have already cited on a similar occasion the words of I.V. Stalin:
"This is work for Hitler!"

The same situation continued in 1943. Of the 22 assault aviation regiments and 193 single crews (which could have equipped 6 more regiments), trained in the 1st reserve aviation brigade in January-April 1943, only 4 regiments were trained in combat use (and this despite the fact that about 77 % of the pilots of the remaining regiments and crews had no combat experience). In particular, the 305th Assault Air Division - in which only 11 pilots had front-line experience - was not trained in the combat use of the IL-2 in the reserve brigade. And in May, this brigade was engaged in outright sabotage: not only did only 27 (i.e. 20%) of the 134 pilots released that month complete the entire course of combat training, 53 %!) underwent ... only ground training for flights!¹⁴⁴ Moreover, "some groups of pilots graduating from the spring - summer of 1943 turned out to be even worse prepared in combat terms than the flight crews graduating from 1942"¹⁴⁵: many experienced teachers and instructors left the reserve brigade for the front.

Of course, in the front-line regiments, measures were taken to complete the training of replenishment - however, it took too long to complete the training (or rather, to teach again). Warring units, of course, did not always have such time. "In their regiment [young pilots. - 4.S.] first trained at the training ground, - recalls I.G. Borisov. "Only after they got used to keeping in line, throwing bombs and shooting, did we take them with us on a sortie." But even then, many of the young pilots "could not stay in line or fell behind"¹⁴⁶: the front regiment could not, in a few days or weeks, firmly instill skills that the flight school and the spare part did not give at all. In the 9th mixed air corps, by the beginning of the Battle of Kursk, the bulk of the pilots, even having undergone additional training in their regiment (during which they managed to complete about 4 flights in the ranks and 2 each for bombing, for firing at a ground target, for air combat and along the route and bring the average raid

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on the IL-2 until 25-41 hours), all the same "did not acquire stable skills in combat use on the IL-2 aircraft, mainly in terms of group flying, air combat, etc." ¹⁴⁷.

Sometimes the frontline did not have the opportunity to complete the education of young pilots at all. "We [...] they turned to the command with a request to give them a few days for their training, - recalled, for example, a veteran of the 210th assault aviation regiment G.F. Sivkov, - and they were very worried when these young guys died in one of their first sorties "¹⁴⁸ As is clear from the context, the command did not allow to complete the training of the replenishment - which "almost had" even "pilot experience" - the command did not allow, and the regiment

I had to immediately throw the youth, who absolutely did not know how to fight, into battle ... Back in 1943, the ability of the front-line units to complete the education of young replenishment was limited by the availability of fuel and the shortage of qualified staff personnel capable of organizing combat training. Finally, in some places you just don't want to deal with young people. In the 820th Assault Aviation Regiment of the 292nd Assault Aviation Division of the 2nd Air Army of the 1st Ukrainian Front, they "didn't stand on ceremony" with young reinforcements, not only in 1943, but even in 1944-1945. - when, according to N.I. Purgin, who reported this, it became easier to fight. "I don't remember checking the piloting technique," emphasizes the former deputy squadron commander Purgin. - You came, there is a flight book - you will fly. How you fly is your business!"⁴⁹.

In 1941-1943, the low level of training of the majority of attack pilots was also determined by the vicious system of recruiting front-line air units. Instead of replenishing the fighting regiments in a timely manner, the command waited until they were almost completely knocked out - and only then, having taken them to the rear for reorganization, did they replenish them. As a result, the regiment was staffed with almost one half-untrained flying youth. Mostly the latter was completed then by the newly formed units. At the front, deprived

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guardianship of experienced pilots, young people quickly perished - and the depopulated regiments again went to reorganize in the rear. There they were again staffed with yesterday's undereducated cadets - and everything started all over again ... Of the 356 assault aviation regiments formed in 1941-1943, 140 (39.3%) were reorganized like this once; 103 (28.9%) - twice; 61 (17.1%) - three times; 31 (8.7%) - four times, and 21 (5.9%) - five times...¹⁵⁰

As a result, firstly, most of the regiments at the front could not inflict any significant damage on the enemy - for they consisted mainly of poorly trained youth. So, even in the "most prosperous" of the assault air units that arrived in the summer of 1942 in the Stalingrad direction, yesterday's cadets made up 70% of the flight personnel! In the 9th mixed air corps of the 17th air army of the Southwestern Front, the picture was no better, and by the beginning of the Battle of Kursk you were: all of its assault air regiments (with the exception of the 672nd regiment of the 306th assault air division) "although they participated in battles in 1941-1942, but due to losses and complete replacement of personnel, they had no combat experience. For example, in the 237th regiment of the 305th assault air division, all but four pilots made their first sortie on the first day of the Battle of Kursk, July 5, 1943 (and one of the four who fought did their second). Having not worked out group flying, they were able to act only as part of a pair. That's right - in separate pairs, which applied only "pin

injections" - they stormed the German airfield Osnova near Kharkov that day. They carried out the way out of the attack just as separately - and on the very first day they lost 10 pilots and 13 Il-2122s, i.e. 30% of the flight crew and 40% of the aircraft fleet ... And here is the report of the General Staff officer at the headquarters of the 17th Air Army, Lieutenant Colonel Asaulov, on the actions of the 306th division: you are different groups. Above the goal, the order of formation was not maintained, the crews acted alone, whoever was in what much. From the fire of anti-aircraft artillery, the crews scattered into different

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side, not knowing where the leaders of the groups and their planes were, the paired battle formation was not maintained "...!53

A significant part of the aircraft in the assault regiments simply stood idle - due to the lack of trained combat pilots. So, on the eve of the Battle of Kursk, in the 2nd Air Army of the Voronezh and 17th - South-Western Front, 488 serviceable Il-2s accounted for only 359 combat ready crews, and in the 16th Air Army of the Central Front - even 109 for 267 serviceable attack aircraft!54. In other words, one could hope to get real benefit from only 62% of the available number of serviceable Il-2 aircraft - and this was in the main strategic direction at that moment! In the 1st Air Army of the Western Front, the 232nd Assault Air Division was not able to participate in the Oryol operation, which began on July 12, 1943: its flight personnel did not complete the entire training course for the combat use of the IL-2. "Due to the unprepared flight personnel" the 571st assault aviation regiment of the 224th assault aviation division of the same army took only a limited part in this operation ... 155

Secondly, with such a system of recruiting, young pilots, as a rule, died faster than they had time to gain more or less decent experience - and the cadre of experienced attack pilots accumulated more slowly than they could. Thirdly, experienced pilots - every now and then setting off with the remnants of the regiment to reorganize the rear - unwittingly spent a significant part of the time outside the front - which means that they also inflicted less damage on the enemy than they could.

Only from the middle of 1943 did assault air units begin to be replenished directly at the front - while they still retained the backbone of experienced pilots - so that undertrained youth joined the regiment in small groups and did not reduce the combat effectiveness of the unit as much as before. In addition, now there was someone to put it into operation, to share combat experience. And the growth of the effectiveness of the IL-2 in 1944-1945. One can, I think, be associated with this increase in the proportion of experienced pilots in the front regiments. (It has become

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also possible due to the decrease in the level of relative losses of IL-2 at this time. As before, many attack aircraft perished, but now many more of them arrived at the front, and an individual pilot - especially an experienced one - had increased chances of surviving.) "Soviet pilots," notes W. whether enviable flexibility during the performance of combat missions when searching for suitable targets", "were more fully used" to increase the effectiveness of the strike "weather conditions, terrain features"!56. At the end of the war, IL-2s could in some places use complicated, requiring good group flying, but also more effective battle formations. For example, in the 16th Air Army of the 1st Belorussian Front during the Berlin operation, in April 1945, attack aircraft, attacking a target, sometimes formed not a "circle of aircraft", but a "circle of pairs (fours, sixes)" . In other words, in a circle, diving in turn at the target, it was no longer single "silts" that flew, but pairs, fours or sixes - each in the formation of a bearing. Accordingly, the impact power increased two, four or six times ... (Here, yes, it should have also affected the fact that in 1944 the IL-2 - thanks to the installation of the "arrow" wing - became more stable and, correspondingly easier to pilot.)

It increased slightly in 1944-1945. and the quality of training of flight school graduates in spare parts. "A strict rule was introduced: no training for combat use as part of groups (pair, link, squadron) [not to mention single training. - A.S.] do not send crews to the front" 57. During the month of being in the spring of 1944 in the training aviation regiment, recalls the veteran of the 953rd assault aviation regiment I.I. Konovalov, "we trained very well to bomb and shoot" !58.

However, the progress made in 1944-1945 in the training of Soviet ground attack pilots should not be exaggerated either. The increase in the total flight time and the number of flights for the development of combat use in spare parts only compensated for the deterioration in the quality of the work of flight schools, which in 1944 gave the IL-2 pilot even less skills,

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than in 1943 (when there were still quite a few graduating students who started studying before the war and managed to get more solid theoretical training). So, in schools in 1944 they didn't teach not only laying a route, but even reading a map and using a compass, they didn't introduce not only the instructions for bombing, but even the methods of bombing themselves and the aiming equipment of an attack aircraft .. In the opinion of the Germans, the initial "insufficient training of young pilots arriving at the front" continued to reduce the effectiveness of the IL-2 at this time too! 5?. Sometimes it could affect combat capability

parts just as catastrophically as in the previous periods of the war. So, at the beginning of May 1944, on the eve of the decisive days of the Crimean operation! - The 11th assault air division of the Black Sea Fleet Air Force began to "experience significant difficulties with trained personnel"¹⁶⁰. At that time, apparently, the division did not have the opportunity to finish training the young replenishment - and, meanwhile, serious training was still required... —1945 "in terms of capabilities and effectiveness" was inferior to the Anglo-American¹⁶¹.

5. HOW INTENSIVELY IS NUMEROUS IL-2 USED? .-

Since one of the components of the effectiveness of aviation operations is the intensity of the use of the aircraft fleet, the effectiveness of the operations of Soviet ground attack air units was also reduced by their insufficient material and technical support. The traditional flaw of the Soviet military system - insufficient attention to all types of support for combat operations - manifested itself here too ...

The aviation rear did not have a sufficient number of vehicles - and, for example, during the battle for Moscow, in approx.

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In October-November 1941, in the assault air regiments of the Air Force of the Western Front, there were interruptions in ammunition every now and then. As a result, the preparation of the IL-2 for the next flight was delayed up to one and a half to two hours; Departures were late, and sometimes even completely frustrated. History repeated itself a year later, during the Soviet counteroffensive at Stalingrad. In November 1942, the lack of vehicles delivering fuel and air bombs disrupted many IL-2 sorties of the 16th Air Army of the Don Front and the 214th Assault Air Division of the 8th Air Army of the Stalingrad Front. Or reduced the effectiveness of strikes: attack aircraft often had to drop not the bombs that the nature of the target required, but those that still remained at the airfield ... And the combat work of the 5th Air Army of the 2nd Ukrainian Front at the end of May 1944- go - just at that moment when the Germans and Romanians first prepared, and then launched an offensive near Iasi! — limited the lack of fuel. Army trucks could not cope with the delivery of gasoline, and there were too few planes in the only (!) transport aviation regiment of the 5th Air Force ... To a large extent

finishes, therefore, in the first three days of the German-Romanian offensive, May 30 - June 1, 1944, the army managed to take only 60% of its aircraft into the air! 6? (including, apparently, IL-2).

Throughout the war - in particular, near Moscow in the autumn of 1941, and near Iasi in the spring of 1944 - there was a shortage of spare parts in the assault aviation regiments. And in the 41st - 42nd, the problem of repair and maintenance of the Il-2 was also complicated by the low qualification of the technical staff. So, at the end of 1941, 90% of the technicians of assault air units did not have a special education, many did not know the Il-2 aircraft and the AM-38 engine, the armed forces did not know how to maintain cannons and machine guns - because of which they often refused to fight !

63. Neglecting the training of pilots, the command treated the training of technicians in exactly the same way ... To a large extent, therefore, half (48.6%) of the Il-2s available in the army at the beginning of the battle for Moscow - to | October 1941 - was out of order. Back to top

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Soviet counter-offensive near Moscow (December 5, 1941), a third (31.4%) of the "humpback" remained defective; on average, the percentage of faulty IL-2s in the assault units in the 41st was 32. In the 42nd it dropped to 21.4 - however, the proportion of malfunctions due to technical illiteracy or negligence of pilots and technicians remained very high. So, in the 8th Air Army of the Stalingrad Front in December 1942, these reasons caused 39% of all malfunctions of the Il-2 - which "largely affected the intensity of combat work"...164

Only in the 43rd technical staff began to maintain the combat readiness of the IL-2 fleet at a completely satisfactory level. By the beginning of the Battle of Kursk, in the assault air units of the 2nd, 15th, 16th and 17th air armies (respectively, the Voronezh, Bryansk, Central and Southwestern fronts), only 9.7% of the aircraft were out of order - 115 of 1184165. But the preparation of the aircraft for the flight still took more time than in the assault aviation of the Luftwaffe. Here the insufficient convenience of the IL-2 aircraft in maintenance has already affected. "The availability of units," emphasizes the former mechanic of the 109th Guards Attack Aviation Regiment V.V. Usov, "was very poor. For example, perhaps only I could screw one tricky nut onto the engine compressor in the entire regiment, since I was thin and flexible! One way or another, while in German ground attack aviation aircraft were able to carry out 5-10 sorties a day, in the Soviet one they usually could not provide such a level. In the 810th assault aviation regiment of the 225th assault aviation division of the 15th air army, according to the memoirs of his former pilot I.I. 67. N.I. Purgin - in whose 820th assault air regiment of the 292nd assault air division of the 2nd air army, the intensity of combat work

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you were the same - it focuses precisely on the insufficient capabilities of ground services: "We didn't have time anymore. Although physically they could have done more." In this, the veteran of the 953rd assault aviation regiment of the 311th assault aviation division of the 1st air army, I.I. Physically, I could handle more." "Here it depends only on the speed of the suspension of the weapon," confirms V.G.

True, we add, other things being equal, the intensity of the use of the Il-2 was often reduced by the inability of the command to deploy a network of airfields close enough to the front line in time. Because of this (as, for example, during the counter-offensive near Stalingrad), the "humped" were forced to fly almost to their maximum range - which means they made fewer sorties per day than they could. And the inability to organize an airfield maneuver during the offensive sometimes led to the fact that the range of the Il-2 generally ceased to be enough and the attack aircraft were forced to remain inactive. Thus, [the 103rd assault aviation regiment of the 230th assault aviation division of the 4th air army of the 2nd Belorussian Front during the Belorussian strategic operation, due to the unavailability of operational airfields, did not fly to combat missions from July 3 to 20, 1944. - just in those days when the troops of the front repelled strong German counterattacks near Grodno and Svisloch ... Obviously, the difficulties with relocation were caused and noted by the General Staff of the Red Army "delay in sorties of aviation to call the commanders of mobile formations" during the actions of the latter in the operational depth in during the summer operations of 1944 on the 3rd, 2nd, 1st Belorussian and 1st Ukrainian fronts⁶⁹.

The result of inattention to the training of the flight (who had to be trained for a long time before being sent into battle) and the technical staff and to the logistics of hostilities was low in comparison

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niyu with the German intensity of the use of numerous Soviet attack aircraft. For example, the 233rd assault air division of the 4th air army of the 2nd Belorussian Front, participating in the Belarusian strategic operation, from June 23 to 1 August 1944 made 2000 sorties to support the advancing troops⁷⁰. Even if we assume (by analogy with the 230th division of the same army) that during 2.5 of these 5.5 weeks the "humpbacks" were not allowed to work too rapidly moving the front line to the west, then even then the intensity of combat work

the division will be four times (!) lower than the one that a little earlier, during the German-Romanian offensive near Iasi, demonstrated approximately equal to the 233rd in terms of the total number of aircraft (93 L18 7) Guy Sh groups and the 10th (anti-tank) detachment 2 th Assault Squadron of the Luftwaffe. Vedza half the time - 1.5 weeks (from May 30 to June 8 [1944]) - these units and subunits carried out twice as many sorties as the Soviet division - about 4,000,171. And during the German offensive on the Kursk Bulge, their The 2nd and 77th dive squadrons - also comparable in number to the Soviet air divisions - made 2000 sorties each in 5 days: on July 5-9, 1943, their L187 flew on combat missions 4010 times! 72.

If the Germans had at least (\$ 1c!) 140 attack pilots made over 400 sorties during the war (including 45 - from 400 to 600, 38 - from 600 to 800, 34 - from 800 to 1000, 22 - from 1000 to 1400, and H.-U. up to 5 - more than 500 and | - more than 700)173. And the point here is by no means that many of the German pilots began to fight back in 1939-1940. To verify this, it suffices to compare the number of sorties made by Soviet and German pilots in the same period of time. Take, for example, twice Heroes of the Soviet Union, who fought in attack aviation throughout the Great Patriotic War - M. Z. Bondarenko, V. M. Golubev, A. E. Mazurenko,

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G.M. Mylnikova, M.P. Odintsova, G.M. During this time they completed from 216 to about 300 sorties - and K. Plenzat and H. Stahl from the 2nd assault (until October 18, 1943 - dive) squadron of the Luftwaffe - about 1200 each; G. Styudemann from the 77th assault (until October 18, 1943 - dive) - about 990; 3. Fisher from the 1st assault (until October 18, 1943 - dive), from July 8, 1941 to April 17, 1945 - 701 ... 174

If twice Hero of the Soviet Union I.A. Vorobyov from the 76th Guards Attack Aviation Regiment actually made about 400 sorties (according to other sources, only 324), then it took him 33 months to do this (from August 1942 until the end of the war) , Hero of the Soviet Union V.L. Ilchenko from the 75th Guards Assault - 36 (from May 1942 to the end of the war), Hero of the Soviet Union S.A. 1st Guards Assault Air Division) - about 40 (from December 1941 to April 1945) - and only Hero of the Soviet Union N.V. Ivanov from the 59th Guards Assault Aviation Regiment of the 2nd Guards Assault Air Division about 400 sorties was able to complete in 26-27 months (from October 1942 to the beginning of 1945). The Germans also recruited such a number for 18-18.5 (F. Lang from the 2nd, and then

1st squadron from August 23, 1942 to March 7, 1944, H. Stahl from the 2nd squadron from December 42 to May 44), and for 12 (TNordmann from the 1st squadron from August 41 th to August 42nd, K. Henze from the 77th squadron from July 42nd to July 43rd, A.Voznitsa from the same formation from March 44th to April 8, 1945) and even for 6 , 5 months (H.U. Rudel from the 2nd squadron from June 1 to December 22, 1944). And in 33 months (from June 22, 1941 to March 30, 1944), A. Beurst, who fought in the 2nd squadron, managed to complete not about 400, but 1003 sorties on the Soviet-German front...!75

The second place among the Soviet attack pilots - twice Heroes of the Soviet Union - is taken by T.Ya. Begeldinov from the 144th Guards Assault Aviation Regiment of the 9th Guards Assault Air Division; your 306 combat you

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he made years in 28 months (from January 1943 until the end of the war). German pilots reached the number 300 in 16 months (H. Buchner from the 1st assault squadron (1st formation) from April 26, 1942 to August 27, 1943), and in 9 (F. Lang from 2 -th dive squadron from November 41st to August 42nd), and for 6 (J. Zemsky from the 1st dive squadron in February - August 42nd). For 28 months, J. Huber from the 77th assault (former dive) squadron flew out on combat missions not 305, but 702 times, but A. Korol from the 2nd (who started and finished fighting simultaneously with T.Ya. Begeldi new) — 715... Twice [Heroes of the Soviet Union E.M. Yauer niki H. Bruk from the 77th assault (former dive) squadron - more than 550 and about 700; twice Hero of the Soviet Union I.Kh. 762...176

Comparisons can be continued for a long time ... If twice [swarm of the Soviet Union A.N. Efimov, who fought in the 198th, and then in the 62nd assault air regiment of the 233rd assault air division, completed 222 sorties in 31 months, and twice Hero of the Soviet Union G.M. Mylnikov from the 15th Guards Assault - 223 for 43, then J. Huber from the 77th dive squadron made 221 sorties in just 14 months (from June 42 to August 43- th). About 240 sorties twice Hero of the Soviet Union N.G. -7 months (from April to October 30, 1942); R.Mrkva from the 2nd assault (former dive) performed 236 sorties in 10 months (from July 44th to April 45th), and V. Panze from the 1st assault (former dive) did for 3 months (in May-July 1944)!77. It is no coincidence that the information

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about 240 sorties made by the Hero of the Soviet Union G.G. Cherkashin from the 672nd assault aviation regiment of the 306th assault aviation division, "even among some famous air aces today [...] causes, if not doubt, then surprise. That's for sure. 240 sorties in a year and a half of the war [from November 1943 to the end. - A.S.], in their opinion, this is too much "...178 About 200 sorties, which twice Hero of the Soviet Union M.G. Gareev from the 76th Guards Attack Aviation Regiment, accumulated in 22 months until August 1944), K. Lau from the 2nd assault squadron completed in 12 months (from April 44th to April 45th), A. Kuffner from the 3rd dive squadron and R.-G. von Malapert-Neufville and H. Frank from the 1st assault squadron (1st formation) - for 3 months (respectively, in the war - March, January - April and September - November 42), H.U. Rudel from 2 1st picking - for two (from August 12 to October 9, 1943), and T. Nordmann from the 1st picking - for a little over one and a half (from February 1 to about March 20, 1943) ... 179

As you can see, even in the last months of the war, when there was not enough fuel in the Luftwaffe, experienced German attack aircraft pilots still took to the air more often than experienced Soviet ones. Let us give one more example: A.N. Efimovs on June 26, 1944 to the end of March 1945 flew 100 times on combat missions, T.Ya. Begeldinov for June 1944 - February 1945 - 120, a. from the 2nd assault squadron from August 1944 to April 1945 (that is, also in 9 months) - 360 times!30. (And A. Burst from the 2nd and K. Stifter from the 77th dive squadron made 100 sorties not in nine, but in just one month - the first from July 25 to August 28, 1943, by the author - for June 1942 The famous H.U.

Thus, the low intensity of use of the aircraft fleet compared to the German one reduced the effectiveness of Soviet attack aviation not only by reducing the number of strikes that the Il-2 could

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inflict on the enemy, but also by the fact that it prevented the Soviet Kam-attack pilots from gaining combat experience comparable to the experience of the German ones.

6. WHY THE "FLYING TANKS" IL-2
SUFFERED HUGE LOSSES?

As we have already noted in the first part, the degree of effectiveness of troop actions, among other things, is also determined by the level of losses they have suffered. For this reason alone, it is impossible not to pay attention to the fact that not a single type of aviation in the Soviet Air Force suffered such huge (in relative terms) losses as attack aviation. So, in the period from June 22, 1941 to July 1942, one fighter aircraft was irretrievably lost for combat reasons after an average of 28 sorties, a bomber after 14, and an attack aircraft after 13. , 48 and 26 sorties, on November 1, 1944 - 127, 125 and 85, and in January - August 1945 - 194, 133 and 90182.

If, however, we ignore the average figures and look at the irretrievable combat losses of specific units and formations of attack aviation in specific operations, then the picture will often turn out to be much worse! So, in July - September 1941, one Il-2 was lost on average not in 13; in 8-9 sorties, there were also regiments where the "humpbacked" managed to fly to combat missions only 3-4 times ... In the 874th assault air regiment of the 267th assault air division of the 2nd air army of the Voronezh Front in the From July 27 to September 18, 1942, for one combat loss of the Il-2, there were not 26, but only 9 sorties; in the 945th regiment of the 206th division of the 8th air army of the Stalingrad Front from October 13 to December 22, 1942 - not 26, but 11; in the 198th regiment of the 233rd division of the 1st air army of the Western Front at the end of 1942, the pilot died on average after 8 sorties ... In the first six days of the Battle of Kursk (July 5-10

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1943) in the 2nd Air Army of the Voronezh Front, assault air units lost one aircraft on average, again, not 26 (and even more so, not 85), but 16-17 sorties, in the 16th Air Army of the Central Front - in 13 , the 306th assault air division of the 17th air army of the Southwestern Front (July 5-7) - only 2.8, and the 305th - 2.2! In the 3rd Air Army of the 1st Baltic Front in the summer of 1944, in the Vitebsk-Orsha, Polotsk, Rezhitsa-Dvina and Siauliai operations, one irretrievable combat loss of the Il-2 also accounted for not 85 (or so), but only 36 sorties!83.

You can understand how high the level of combat losses of the Il-2 was by comparing it with the level of combat losses of the main German "battlefield aircraft" - Li87 dive bombers. Back in the middle of 1943, this latter was several times, sometimes an order of magnitude smaller than the Il-2! If in the assault air units of the 2nd Air Army in the first week of the Battle of Kursk one aircraft was lost, as we have seen, in 16-17 sorties, then in the 2nd and 77th Luftwaffe dive squadrons fighting on the same sector of the front - only in 153!184 The gap was preserved here several times in the middle of 1944: if in attack aircraft

units of the 3rd Air Army during the Belarussian strategic operation, for one aircraft irretrievably lost for combat reasons, there were 36 sorties, then in the 2nd assault squadron of the Luftwaffe during the German-Romanian offensive near Iasi on May 30 - June 8, 1944. - at least (\$1s!) 160...185 And this despite the fact that the intensity of the use of L187 aircraft was, as we have seen, not less, but more than that of the IL-2!

Such a level of combat losses not only reinforces our opinion about the insufficiently high effectiveness of the actions of Soviet attack aircraft, but also forces us (following the German experts) to single out as another factor that reduced this effectiveness, the effective opposition of German anti-aircraft artillery and fighter aircraft.

Note that this opposition not only brought

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many IL-2s from the game even before they hit the target. Under the fire of German anti-aircraft guns, the actions of the surviving attack aircraft also became less effective. According to German front-line experts, in 1942-1945. (especially from the end of 1943) the fire of small-caliber anti-aircraft artillery "quite often" forced the "sils" to attack from higher than usual heights - and this reduced the accuracy of shooting and bombing!36. Sometimes - despite the fact that "German field commanders characterize the personnel of the Soviet attack aircraft as aggressive, courageous and stubborn"!87 - Wehrmacht air defense generally disrupted the performance of "humped" combat missions. So, in 1941, having stumbled upon dense anti-aircraft fire, IL-2 "often simply dropped bombs and went back" 188. V. Schwabedissen also mentions the order of the commander of the 16 ordered the escort fighters "in the event that attack aircraft fail to fulfill their combat mission, open fire on them and force them to repeat attacks on ground targets"! Undoubtedly, this desire of the IL-2 pilots to leave the battlefield as soon as possible was caused by deadly anti-aircraft fire ... However, to disrupt the fulfillment of a combat mission (although, according to and fighter squadrons of V. Lipfert, "not very often"! 190) German fighters could also. One such case is also reported by a Soviet source - a report by the leader of the "Yak" group of the 900th Fighter Aviation Regiment; according to him, | On September 1944, in the Shaki region (Lithuania), five attack aircraft of the | th air army of the 3rd Belorussian Front, seeing that escort fighters were attacked by a large group of E \ / 190, refused to attack the target and went to their territory .. !1! Due to the activity of German fighters in the first days of the Battle of Kursk, on July 5-10, 1943, the Soviet command itself had to use the IL-2 "with a little tension." (And still by July 11

The 2nd Air Army of the Voronezh Front lost - mainly fighter attacks - 39% of its attack aircraft

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(107 vehicles out of 276), and the 16th Air Army of the Central Front lost 50% of its Il-2s by July 10 - 148 out of 295192.)

Finally, huge losses preserved the above-described low experience of the flight personnel of the Soviet attack aviation in comparison with the German one.

Turning to the analysis of the reasons for the exorbitantly high losses of the Il-2, let us first of all ask ourselves the question: how did it happen that such a low combat survivability was demonstrated by an aircraft, the main advantage of which was and is considered to be "reliable armor"? Recall that S.V. Ilyushin saw the very meaning of the creation of the Il-2 precisely in the need to reserve "all vital parts" of an attack aircraft!33. The entire forward and middle part of the fuselage of the "silt" was a single armored hull, inside which the engine, radiators, petrol and oil tanks, and the pilot were located ...

There is no paradox here, however. Let's start with the fact that for 1941-1945. the vaunted armor of the Il-2 - conceived after all in 1938 - was no longer sufficient, for it reliably protected only from rifle-caliber bullets. Meanwhile, on all German fighters used on the Soviet-German front, there were aircraft guns: on the Messerschmitt BE109E> - two 20-mm MOEE on B(109E - one 15-mm MO151 / 15 or 20-mm MoO151 / 20 , on BE109@ - either one MO 151/20, or three of these guns, or one 30-mm MK108, on V # 109K - one MO151 / 20 or MK108, on the Focke-Wulf E! 190A - or two MS 151/20 and two MOSE or four MS151/20. A 12-mm transverse plate (just behind which there was a gas tank and a pilot) behind the IL-2 armored hull, which was behind it, even 15-mm armor-piercing shells made their way from 400 m - if they hit it at an angle of at least 50 °. From 100 m - if the angle of contact with the armor was at least 60 ° - 15-mm high-explosive shells also broke through this armor plate. And the "Messer Schmitts", attacking the Il-2, approached them both at 50 and at 40

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meters ... On the side, the pilot, tanks and radiators were covered with only 6 mm armor, from below - 4 mm; the engine was protected only by a 4 mm armored hood (the top sheet of which became 5 mm from the spring of 1942). Already from 400 m, 15-mm armor-piercing shells penetrated 6-mm sheets, even if they hit them at an angle of only 20 °! 15-mm high-explosive at a distance of 100 m pierced the side armor of the IL-2 even at an angle of impact

30 degrees!34.

But on the vast majority of "Messers" - starting with B # 109E-4, which appeared on the Soviet-German front already in August 1941 - and on all the "Fokkers" were not MO151/15, but much more powerful MS151/20! Already from 600 m, the 4-mm armored hood of the "silt" was deployed, hitting the engine, even their high-explosive shells - so much so that the diameter of the holes reached 160 mm ... In the 6-mm upper armor of the pilot's cabin, high-explosive 20-mm shells made holes with a diameter of 80-170 mm. And the 4-mm floor of the cabin, according to the testimony of the German ace E. Hartmann, the shells of the MC151 / 20 gun, when fired at point-blank range, penetrated it, even hitting it at an angle of only 10 degrees! 95.

All these circumstances (with the exception of the last one) were revealed during field tests, as well as as a result of a survey by Soviet specialists on the Il-2 armored hulls damaged in battle. The front-line soldiers testify to the same; Thus, the fact of splitting the armor with a Messer live projectile of the 12-mm rear armor plate of the "silt" was recorded in the diary entry of the air gunner of the 198th assault aviation regiment of the 233rd assault air division of the 1st air army of the Western Front by G. Dobrov for July 13, 1943 .196. Former pilot of the same unit A.N. Efi-. The mov describes a number of episodes when Messerschmittov and Focke-Wulf shells pierced the armored hood of an attack aircraft and disabled the engine!97. Therefore, the high ratings of the Il-2 armor - even those given by the German participants in the war!98 - must be recognized as at least exaggerated.

But why were such ratings given anyway? And what about the indication of R / Toliver and T.J. Constable that the German

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Which pilots have repeatedly observed how their shells jump from the armored hull of the Il-2?! 2? The latter is quite understandable: apparently, we are talking about cases where the angle of impact with the armor turned out to be too small and the shells ricocheted. And there must have been many such cases. After all, back in 1942 - the first half of 1943. (namely, the evidence cited by Toliver and Constable belongs to this period) "Messerschmitts", as a rule, attacked the Il-2 from behind and a little from the side - while trying to hit the engine and the pilot. As a result - judging by the holes in the armored hulls of the Il-2, decommissioned in the winter of the 42nd - in the spring of the 43rd - the angle between the flight directions of the "silt" and "Messer Ra" almost always did not exceed 20 degrees? 00 - so from the longitudinal armor of the Il-2 the projectiles really should have bounced a lot. Especially from the armored hood with its double curvature plates; Apparently, the veteran of the 210th assault aviation regiment G.F. Sivkov recalls precisely such cases: "At first, when meeting with "silts", the Germans hit right on the forward part of the fuselage. Some of them used up all their ammunition, but the attack aircraft continued flying"?0!

(by acquiring, let us add, from the enemy the reputation of a "concrete bomber" (Khetep@otbeg)²⁰² and the most "hard-to-kill" of Soviet aircraft). Most likely, it was precisely after such cases in the 54th fighter squadron of the Luftwaffe in 1941 that the opinion was formed that the IL-2 "is very difficult to shoot down when attacked from behind due to excellent armor", and the 51st (in November 1941) - that the 15-mm gun MO151/15 is ineffective against the IL-2²⁰³.

But it was only necessary for the German fighter to attack the attack aircraft at a large angle to the direction of its flight, i.e. come in more abruptly from the side - and the armor of the "concrete bomber" ceased to seem invulnerable ... In particular, on November 8, 1941, Chief Sergeant Major G. Kaiser from the III group of the 77th fighter squadron, which was then operating in the Crimea, was clearly convinced of this. After he failed to shoot down the IL-2 on the 7th, the Inspector General of the Luftwaffe Fighter Aviation, Colonel W. Mölders himself, undertook to demonstrate to him effective methods of destroying attack aircraft.

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"A quick turn," recalls Kaiser, "and at an angle of 30 degrees [not 20 degrees or less! - A.S.] his turn digs into the Russian attack aircraft in the cockpit area. The enemy plane immediately flared up and crashed. The next moment, his voice was heard again: "Did you see how I did it? Attack the next one!"

I performed his technique, and the IL-2 crashed into the ground. "Repeat!" Almost like in a training battle: the same approach to the target, a short burst, and the third attack aircraft falls on fire"²⁹⁴.

The fact that the best results in attacks on the IL-2 gives a side approach with firing on the sides of the cockpit was eventually found out by the pilots of the 54th Fighter Squadron²⁶⁵. However, the initial disappointment experienced by non-German pilots when firing at the IL-2 was, apparently, too strong. Only this can explain the fact that exaggerated ideas about the invulnerability of the "concrete bomber" turned out to be very tenacious and firmly entrenched in post-war foreign literature.

As for the German anti-aircraft gunners, they also hit the IL-2 not from machine guns, but from 20- and 37-mm automatic guns, and, in addition, their shells hit the attack aircraft, as a rule, almost strictly from the side. As shown by the examination by Soviet specialists of armored hulls damaged by German anti-aircraft guns, the angle of contact between an anti-aircraft projectile and the "silt" armor in most cases was not less than 65-70 ° in the horizontal plane and not less than 75-80 ° in the vertical plane²⁰⁶. Undoubtedly, this is why the anti-aircraft gun shells penetrated the armor of the "humped" almost twice as often as the shells of the German fighters²⁰⁷ - who attacked mainly from behind. (It also affected, of course, the fact that German anti-aircraft gunners used, along with 20-mm, and

37-mm caliber.) True, I.I. Pstygo, who fought in the 504th and 893rd assault air regiments, claims that only armor-piercing, but by no means fragmentation shells of 20-mm anti-aircraft guns could penetrate the armor of the Il-2? However, V.I. Perov and O.V. Rastrenin, referring to the results of a survey of armored hulls "silts" damaged in battle, as well as to the results of field tests, indicate that in their own way

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the striking effect of the shells of 20-mm anti-aircraft guns was practically no different from the shells of 20-mm air guns? The same authors will also include a photograph of the holes made in the side armor of the Il-2 by a high-explosive fragmentation projectile of a 20-mm anti-aircraft gun. So the statement of I.I. Pstygo (as well as the statement of V. Shvabedissen that the armor of the Il-2 "withstood the hit of small-caliber anti-aircraft shells"210) can be considered true only for those cases when the angle of contact of the anti-aircraft shell with the armor turned out to be too small. True, such cases were by no means isolated. They were observed, for example, by V.A. Tikhomirov, pilot of the 12th Fighter Aviation Regiment of the Navy Air Force, who covered the Il-2 over Danzig in the spring of 1945; Apparently, just such a case was observed in October 1941, during an Il-2 strike on the Molvotitsy airfield south of Demyansk, and the German military doctor H. Killian: target, but fly off to the sides. It is clearly visible"?1.

In general, the armor of the IL-2 could help him out only when a projectile hit the armor plate at a very small angle. True, the armored hull, which did not collapse during a forced belly landing, saved the lives of many pilots of downed attack aircraft, but that is another question - about the losses of pilots. A.N. Efimov also notes the "calming" psychological effect of booking on the pilot: "[...] You feel protected from all dangers. The impression of the reliability of the cockpit and the aircraft did not leave even in flight. The whole face of the machine caused a combat enthusiasm, helped to suppress the feeling of danger under enemy fire»?!?. The latter, undoubtedly, should have increased the efficiency of the pilot's actions when attacking the target. However, this cannot obscure the fact that the Il-2 armor was not reliable protection against the fire of German fighters and anti-aircraft guns.

However, even if this armor is impenetrable, its all

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the circumstance that the "flying tank" was almost half wooden would have equally depreciated. Due to non-

grip of aluminum, the entire tail section of the Il-2 fuselage with a keel, vehicles manufactured in 1942 - early 1944, and also the skin (and sometimes the power set, with the exception of the spars) of the wing consoles?! 3 were made of wood - and therefore differed in low resistance to projectiles. "If the Oerlikon projectile [20-mm anti-aircraft guns. - A.S.] hit the Il-2 with a metal wing, - G.F. Sivkov testifies, - he made a hole with a diameter of up to 200 mm with torn edges. The aircraft continued to fly quietly. If such a projectile hit a wooden wing, up to 30% of the skin was destroyed and a strong list immediately arose. It was difficult to keep the car in level flight"?!4. And the wooden tail section of the "silt" fuselage was often "literally sawn" in half by 20-mm anti-aircraft shells?! It was on the wooden parts of the attack aircraft - trying to "beat off the tail and planes" - that many German fighter pilots also fired from cannons. So, in the 54th fighter squadron of the Luftwaffe, they came to the conclusion that the best results in the fight against the IL-2 (along with firing on the sides of the cockpit) are fired from above on the wings of the pits. And in 1944, they tried to hit her E ! 190 on the wooden fuselage of the "silt"? 16.

In this regard, one should dwell on the significance of such - perhaps most often glorified in Russian literature - quality of the IL-2, as a high survivability of the design. Indeed, the Ilyushin attack aircraft could, apparently, withstand more bullets and shells than other aircraft of the same size and with the same half-wood construction. It is this general survivability of the structure, which is good for a semi-wooden aircraft (and not the mythical "strong armor"), in particular, that must be explained by the statement of the former commander of the 9th anti-aircraft artillery division of the Wehrmacht, V. Pickert, about the insensitivity of the Il-2 to hits of armor-piercing shells 20 - and 37-mm anti-aircraft guns?! 7. But in comparison with all-metal machines, the survivability of the "humpback" should still be recognized as insufficient.

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The huge losses of the Il-2 themselves (the survivability of the design of which, we emphasize once again, are greatly exaggerated in the literature) should be explained primarily by the specifics of the combat use of these attack aircraft. Unlike bombers and fighters, they operated exclusively from low altitudes, which means that more often and longer than other aircraft, they were in the field of real fire from German small-caliber anti-aircraft artillery - this very effective and numerous means of destruction. It was anti-aircraft fire that destroyed most of the IL-2s lost for combat reasons. If we take into account only those "silt" that are known for sure that they were destroyed by anti-aircraft guns or fighters, then in 1941 the proportion of victims of anti-aircraft fire among them was 68.2% (101 aircraft out of 148), in 1942 - 54.6% (203 out of 372), in 1943 - 57.4% (1468 out of 2558), in 1944 - 67.2% (1859 out of 2741), in January - April

1945 - 74% (1048 out of 1417)218. (Note that in 1943-1945, during the period of the general retreat of the enemy, the reasons for the death of the overwhelming majority of downed attack aircraft were already known.)

The extreme danger posed to the Il-2 by German small-caliber anti-aircraft guns was due, firstly, to the perfection of the material part of this weapon. The design of anti-aircraft installations made it possible to very quickly maneuver trajectories in the vertical and horizontal planes; each gun was equipped with an anti-aircraft artillery fire control device that provided corrections for the aircraft's speed and heading; tracer shells made it easier to adjust the fire. Finally, German anti-aircraft guns had a high rate of fire; for example, the 37-mm E|akZ6 installation fired 188 rounds per minute, and the 20-mm EakZ8 - 480219. Secondly, the Germans had a very high saturation of troops and air defense rear facilities with these weapons. The number of barrels covering the targets of the Il-2 strikes continuously increased, and at the beginning of 1945, up to 200-250 20- and 37-mm shells could be fired per second (!) (and

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up to 8000-9000 13.1-mm bullets of heavy anti-aircraft machine guns)? 29. But the attack aircraft were over the battlefield for an average of 10-15-20 minutes ... Thirdly, the high shooting, artillery and tactical skills of the German anti-aircraft gunners had an effect. The small-caliber anti-aircraft battery was ready to give a hearty aimed shot already 20 seconds after the detection of Soviet aircraft; corrections for changing the course of the IL-2, the angle of their dive, speed, range to the target, the Germans entered within 2-3 seconds??!. The concentration of fire of several guns used by them on one target also increased the probability of hitting an attack aircraft - especially if the fire was concentrated at a point through which, becoming in a "circle", all the attacking "silt" ones successively passed ... It is not surprising that, according to According to N.T. Polukarov, a former pilot of the 140th Guards Assault Aviation Regiment of the 8th Guards Assault Air Division, his Il-2, on average, received at least one direct hit from a small-caliber anti-aircraft projectile in every fourth sortie. In the 3rd Air Army of the 1st Baltic Front in June-July 1944, in the Vitebsk-Orsha, Polotsk, Rezhitsko-Dvinsk and Siauliai operations, one attack aircraft damaged by anti-aircraft guns accounted for only 2-3 sorties. And during the strikes of naval Il-2s on naval bases or convoys at sea, German anti-aircraft gunners shot down about 20% of the attacking attack aircraft and caused damage to another 35-40 percent ???

In the first half of the war, the tactics used by them also affected the magnitude of the losses of attack aircraft from anti-aircraft fire. So, in 1941 they demonstrated a common

throughout the Soviet strike aviation of that time, the neglect of anti-aircraft maneuvers - not at all trying to evade routes and shell explosions. (Major General of the Luftwaffe K.. Webe explained this by the poor maneuverability of the Il-2223, but the matter was clearly different - in the poor training of Soviet pilots and (or) their lack of combat experience. After all, later even two-seater "silt" - Whose maneuverability was worse than that of single issue

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1941 - they maneuvered very actively in such a situation.) Such behavior over the target, the Germans emphasized, "led to exceptionally large losses"?

True, in 1941-1942. IL-2 often approached the target at ultra-low altitude. This was supposed to make it difficult for the German anti-aircraft gunners to both detect the "humpbacked" - until the last moment not visible behind the wall of the forest or terrain folds - and their defeat (due to too much angular movement of the target). However, it was noted in the directive of the commander of the Red Army Air Force A.A. Novikov dated August 22, 1942, the enemy still managed to organize "effective countermeasures from the ground to our strafing strikes. On the probable directions of flight of IL-2 aircraft, powerful curtains of anti-aircraft fire are created, for which all types of weapons are used, up to mortars, flamethrowers, land mines, tank and anti-tank guns, as a result of which our attack aircraft suffer significant losses.

Since 1942, flying at medium or low altitudes, IL-2 pilots began to use yaw along the course, sliding (i.e. lateral displacement of the aircraft) and other types of anti-aircraft maneuvers - carried out both by the whole group and by each aircraft separately. However, in this case, either one or two flight parameters were changed (for example, only the heading or heading and altitude), while for reliable evasion of projectiles it was necessary to simultaneously change three parameters - heading, altitude, and speed (change, for example, only one course, the German anti-aircraft gunners quickly took into account and corrected their routes). And this, in turn, required good training of pilots, good group flying - something that was rare in Soviet attack aviation. In addition, the Germans could fend off the anti-aircraft maneuver of the "humpbacks" by setting up barrage fire ... A more reliable way to reduce the losses of the IL-2 from anti-aircraft fire was to suppress anti-aircraft guns - before or simultaneously with the attack on the object. But this, as we have seen, was neglected as early as the first half of 1943 - and only then did they begin to practice constant

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division for this purpose of specially trained equipment

pages and strike at anti-aircraft guns by the forces of a third, half of the guilt, atoms and the entire group. Even if the guns did not succeed in destroying them, their fire became less accurate, or even completely stopped. "When an attack aircraft dived into an anti-aircraft battery," testifies I.I. [...] I don't remember or heard of anti-aircraft gunners winning such a duel at least once"?26. With such tactics of attack aircraft, anti-aircraft guns opened effective fire only at the moment the "humpbacks" left the target ...

Nevertheless - as we saw above - the losses of the Il-2 from anti-aircraft fire (in absolute terms) were increasing: more and more of these aircraft were used at the front, which means that the German anti-aircraft gunners had more and more targets. Because of this, the total amount of combat losses of attack aircraft in 1943-1945. remained approximately at the same level or even increased: in 1943, for combat reasons, the Red Army Air Force lost 3515 of these machines, in 1944 - 3344 (and according to V.I. Alekseenko - 3722), in January - April 1945 - 1691227 (i.e. for the whole year, with the same intensity of hostilities, there could have been a loss of up to 5000 Il-2). And the above-mentioned increase in the number of sorties per one combat loss of IL-2 was achieved only due to a significant increase in the number of Soviet attack aircraft (and also, possibly, due to some increase in the intensity of its use, i.e., an increase in the number of combat missions). goods per aircraft)?28.

Most of the Il-2s lost during the war for combat reasons were destroyed by anti-aircraft guns, but in 1941-1942. most of the irretrievable combat losses (about 60% on average) were caused by fighters?29. In 1943, only 42.6% of those Il-2s became victims of fighters, about which it was known exactly who destroyed them (1090 sa

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molets out of 2558), in 1944 - 32.2% (882 out of 2741), and in January - April 1945 - 26% (369 out of 1417)230. The decrease in losses of the IL-2 from fighters after 1942 was traditionally associated with us primarily with the conversion of the "humpbacked" one-seater into a two-seater, carried out in the fall of 1942. Of course, the installation of an air gunner's cockpit, which covered the aircraft from behind with the fire of a 12.7-mm UBT machine gun, increased the chances of the Il-2 in battles with Messerschmitts and Focke-Wulfs. As shown by theoretical calculations and ground tests, the probability of shooting down a single Il-2 in one attack from behind by a B#109S-2 fighter (with three firing points) was 51%, and by a "five-point" B#1090-2 / K6 - 75 %. For a two-seat attack aircraft, this probability decreased to 38% and 65%, respectively (in all cases it was assumed that the German pilot had excellent flight and gunnery training, and

the attack aircraft does not perform any anti-fighter maneuver - so in a real battle all the indicated numbers should have been somewhat lower)? 3!. However, it can be seen from the above figures that the decrease in the proportion of fighter casualties in the irretrievable combat losses of the Il-2 continued in 1944-1945, when the defensive armament of the "humpbacked" was no longer strengthened (again, we emphasize that at the end of the war, circumstances of the death of the vast majority of the lost attack aircraft). So, it was not the appearance of an air gunner on the IL-2 (or, rather, not only that). The latter, however, is not surprising. We must not forget that the increase in the defensive capabilities of the Il-2 was largely neutralized by the growth in the firepower of German fighters. In the same autumn of 1942, at the same time as the two-seater "silts", "killers" E ! 190 appeared on the Soviet-German front, having as many as six firing points (including four - against one, rarely three on B1109 - guns); in 1943 about 40% of the Luftwaffe fighter groups opposing the Soviet Air Force flew Fokkers, and in 1944 about 25%²³². Shoot down a double Il-2 in the first attack from behind

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HER ! 190A-4 and A-5, which were launched in 1943, could with probability 63% , i.e. with more than previously prevailing among the Germans "three-point" B#109 - single! And B# 1090-6, which in the fall of 1943 replaced the S-2 modification machines and on which both 7.92 mm machine guns were replaced by 13.1 mm machine guns, with a probability of 54%²³³. Subsequently, the armament of German fighters increased even more: in the summer of 1944, E! -mm guns began to receive 30 mm.

In addition, the powerful defensive armament of two local Il-2s often could not be used effectively.

Firstly, the design of the rear firing point, which was hastily designed, was not very successful. The gunner's cockpit "turned out to be cramped and made it difficult to move, which had a negative effect on the effectiveness of air combat"²³⁴. And the UBT machine gun in a hurry could not provide sufficient angles of fire. In particular, the shooter was practically unable to defend the lower hemisphere - which was quickly taken into account by the German pilots, who switched to attacks on the "silts" from below. Others began to enter from the side (after all, the firing angles of the UBT in the horizontal plane were only 35° to the right of the axis of the aircraft and 28° to the left); the third - from above: the elevation angle of the UBT on the two-seater IL 2 was also insufficient ... ²³⁵

Secondly, UBT itself often let down. According to the memoirs of the former air gunner of the 43rd Guards assault aviation regiment G.A. Litvin, he was jammed

tee in every sortie, especially when firing in long bursts; the fact that “the UBT had a lot of failures” is also confirmed by V.V. Usov, who flew as a shooter in the 109th guards assault, and V.M. Mester from the 92nd guards assault testifies that the most valuable The 2nd thing was a case extractor?³⁶.

Finally, the training of aerial gunners was mediocre. Their training was organized belatedly - after the start of production of two-seat attack aircraft, - and

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In 1943, almost the first Red Army soldiers who came across were sent to the arrows of the IL-2. “At first,” recalls V.S. Frolov, a veteran of the 210th assault aviation regiment, “absolutely unprepared guys arrived in the regiments, who were put behind a machine gun and sent on a combat flight. Many of them could not withstand the sharp maneuvers of the attack aircraft during the flight [note that the resulting overloads in the cockpit of the gunner were felt more strongly than in the cockpit. - A.S.]. Some, firing at the enemy, broke the keel or stabilizer of their aircraft and perished along with the pilot”?³⁷. Schools that were supposed to train shooters actually sabotaged this training. So, in 1943, graduates of these schools did not know well both the theory of shooting and the material part of the UBT machine gun (often, we recall, giving refusals), not only they never fired in the air, but they never were (37 “shooters”, arrived in March 1943 from the 2nd Leningrad School of Air Armament Technicians to the 17th Air Army of the Southwestern Front, “the IL-2 aircraft was seen only upon arrival at the front”, and some of those sent by the same school in June in assault air units of the 15th Air Army of the Bryansk Front, did not know what acute, right and obtuse angles were and “had no idea about perpendiculars”)? ³⁸. The attitude towards the training of these attack aircraft crew members was truly not wrecking even at the end of the war! Back in 1944, they were “not taught anywhere” to be careful in the air? ³⁹, and in the Trinity Coy “School” of air gunners at the end of the 44th, were they not taught at all! “In this school,” testifies V.M. Mester, released from there to the 92nd Guards Attack Aviation Regiment in December 1944, “I spent less than a month, of which ten days we were on agricultural work in Kazakhstan, and ten - according to the picture studied the ShKAS machine gun [we recall that the shooter IL 2 had a UBT. - A.S.]. There were no machine guns themselves, not to mention firing. After 20 days of the rank of “private”, we went to the front on our own”?⁴⁰. From the report of the deputy commander of the 7th Guards Assault Aviation Regiment, Guards Major [Udimenko dated June 27, 1945, on the combat work of the unit in the Great Patriotic War, we can conclude that

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there, until the end of the war, “air armament arrows did not pick up

were trained accordingly, as a result, people from penal companies, other units, from where they were sent as extremely undisciplined, etc., arrived in the regiment for replenishment.

And at times, two-seat "silt" were forced to fly without shooters at all: these latter were out of action more than pilots, and, for example, in the 92nd Guards Assault Aviation Regiment of the 4th Guards Assault Air Division of the 5th Air Army of the 2nd On the Ukrainian front, even in 1945, there were days when "there was only one shooter for the six"?⁴².

As a result (as "assessments based on the theory of aerial firing and field tests of the effectiveness of the German small arms and cannon weapons against the Il-2 attack aircraft" show), in the period from the end of 1942 to the autumn of 1943, the probability of shooting down by the Il-2 gunner 2 German fighters were on average less likely to be shot down by this fighter (B11090-2, B109 (-2 / K-6 or E \ 190A 4) of the "silt" itself in the first attack from the rear hemisphere: at a distance of 100 m - approximately 1.6 times, from 150 m - about 3.4 times new, from 200 m - about 4.3 times, and from 250 m - about 4 times. front steel $\ddot{y}109\ddot{y}$ 6 and almost did not differ from the machines of the A-4 E \ / 190A-5 modification), this gap between the theoretical chances of the Il-2 shooter and the German fighter pilot increased on average, respectively, to approximately 3.7; 3.9; 4.5 and 4.9 times.²⁴³ Apparently, the chances differed to approximately the same extent in real battles. In calculations, it was assumed that the German had excellent flying and shooting skills, and the "silt" did not perform an anti-fighter maneuver - but, on the other hand, at the front, among the shooters of the IL-2, there were many "absolutely unprepared re-spent nuclear fuel", and their UBT often jammed ...

What, then, played a decisive role in reducing the losses of the IL-2 from fighters? V.I. Perov and O.V. Rastrenin (as well as V. Shvabedissen) indicate, in particular, the reduction

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increase in the number of German fighter aircraft on the Soviet-German front? ⁴⁴. But the change in this number does not always correlate with the change in the share of fighter casualties in the combat irretrievable losses of the IL-2. In 1941, the average monthly number of Luftwaffe single-engine fighter groups operating on the Soviet-German front was approximately 18; in 1942 - about 15.5; in 1943 - about 12.4; in 1944, about 10.5²⁴⁵. At the same time, in 1944, the Germans increased the number of assault groups equipped with E \ 190E aircraft that could also act as fighters. True, the search for and destruction of Soviet aircraft was not their main task, and only after bombing attacks could they attack the

sewing them Il-2. However, by June 1944 there were as many as eight groups of EU!190E on the Soviet-German front, and, it seems, they completely replaced two or three fighter ones. And in January-February 1945, the number of fighter groups operating against the Soviet Air Force also increased?47. Thus, a real reduction in the number of Luftwaffe fighters in the East took place only in 1942-1943. However, in 1942, the share of fighter casualties in the irretrievable combat losses of the Il-2 did not decrease! And in 1944-1945, on the contrary, continuously decreasing

lass!

Apparently, the level of Il-2 losses from fighters was determined primarily by two other factors (also mentioned by V.I. Perov and O.V. Rastrenin?48):

a) the degree of effectiveness of the actions of Soviet escort fighters and

©) the degree of effectiveness of the defensive tactics of attack aircraft (which, in turn, strongly depended on the level of training of pilots).

In fact, the fighter cover of the Il-2 in 1941-1942. were often not provided - and if this cover was available, did they often abandon their wards, being carried away by the battle with the "Messerschmitts" or escaping from anti-aircraft guns that covered the object of the assault strike?49. No better dey

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there were escort fighters in the first half of 1943. Firstly, as noted in the directive of the commander of the Red Army Air Force dated July 7, 1943, then the interaction between them and the attack aircraft covered by them was still "insufficiently" worked out. It was stated in the directive that "it is often organized for only one sortie, and not for the entire period of a battle or operation, as a result of which the units interacting with each other do not always have the opportunity to carefully coordinate all the necessary issues and acquire skills in joint actions over a long period of time. time. This leads to scattered aviation operations, to a narrowing of their effectiveness and unnecessary losses"?50. Sometimes attack planes and escort fighters taking off from different airfields could not find each other; according to A.N. Efimov, escort fighters in 1943 often lost their wards on the route ... Secondly, Soviet escort fighters still acted tactically illiterately. "When meeting with the enemy", the directive of July 7, 1943 stated, they "easily get involved with them [as in the text. - / A.S.] into battle, breaking away from the covered groups and often losing them"? 7!. Over the target, they also often abandoned their wards and went to a height (where it was safer from anti-aircraft fire) - and after all, the attack aircraft especially needed cover precisely at the moment of exiting the attack (when the next one behind him was in the ranks

busy delivering a blow and could not cover the tail of the previous one) ... Finally, the number of "hawks" allocated then to accompany the Il-2 was also insufficient - in any case, in order to successfully repel the attacks of experienced German pilots of the 43rd of the year.

As a result, even in the summer of 1943, it was not uncommon for German fighters to destroy entire groups of two-seat (!) Il-2s. So, on the first day of the Battle of Kursk, July 5, 1943, the Messerschmitts managed to break off escort fighters from three sixes of the 175th assault aviation regiment of the 17th air army of the South-Western Front - after which they shot down 8 out of 17 double "silts" . carried away

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air combat, left their wards and La-5, escorting two eights of the 237th assault air regiment of the 305th assault air division of the same army. The result was the destruction of 9 out of 16 IL-2s by Messers (including eight doubles). And in one of the air battles on July 7, due to the fact that the escort fighters "did not take appropriate measures to repel the enemy", E\ 190 shot down 5 out of 7 attack aircraft of the 874th regiment of the 299th division of the 16th air army of the Central front (including at least three doubles) ... 252

But after the Battle of Kursk, the fighter cover began to echelon its forces more often - so that while some were engaged in active air combat with the "Messers" or "Fokkers" attacking the group, others were constantly next to the covered attack aircraft. It became much more difficult for the enemy to break through to the "humpbacked" and fire at them ... This is exactly how the "yaks" of the 900th Fighter Aviation Regiment acted, covering in the summer - autumn of 1944, during the Vitebsk-Orsha, Minsk, Vilnius, Kaunas and Goldap (Gumbinen) operations, attack aircraft of the 1st Air Army of the 3rd Belorussian Front. The result of their tactically competent actions was the almost complete absence of losses in the Il-2s accompanied by them in numerous battles with BE109 and E \! 1902 ° 3 (it should, however, be noted that most of the latter belonged, apparently, to assault groups, whose pilots it was more difficult to fight Soviet aircraft than real fighters). Sometimes - at least in the 5th and 17th air armies of the 2nd and 3rd Ukrainian fronts, respectively - along with the groups of "free combat" and direct cover, there was also a group sent forward to clear the airspace (similar to those that worked so effectively for the Germans during Operation Citadel). "The interaction between fighters and attack aircraft," V. Schwabedissen also admits, "constantly grew, therefore, approximately from the end of 1944, the actions of attack aircraft became much more effective"? 54.

In turn, for the misses of the Il-2 escort fighters, even at the very end of the war, they could pay very dearly. So, as early as March 20, 1945, at the beginning of the Vienna operation, the head of communications of the 3rd Guards Fighter Air Corps F.M. two "silts" from the 5th assault air corps of the 5th air army of the 2nd Ukrainian front? 2?. As we can see, neither the UBT machine guns that covered the Il-2 from behind, nor the fact that the attacking Fokkers were not fighters, but attack aircraft, helped. The "silts" of the 953rd assault air regiment of the 311th assault air division of the 2nd air army of the 1st Ukrainian Front, "often" threw attack aircraft on the way back from the target - because of which they, even switching to strafing flight, "suffered losses from enemy fighters?56. Here, however, apparently, the small supply of fuel of the Soviet "hawks" affected ...

As for the defensive tactics of the Il-2, in 1941-1942. it was distinguished by passivity, unwillingness to take up combat with attacking fighters, using maneuver and wing weapon fire (recall that there were no rear arrows of the Humpback Point at that time). Thus, the pilots of the 77th dive squadron of the Luftwaffe G. Pabst and E. Stoll Berberich more than once observed in the 4 | to leave, sometimes until the complete annihilation of their group"257. Apparently, these attack aircraft flew to the target; If I were (which happened more often) attacked after striking, the "humpbacks" tried to get away at increased speed. At the same time, they, as a rule, pressed against the ground itself (av41-mic targets preferred to go at low level). After all, it was not easy for a fighter pilot to spot a dark green attack aircraft flying at an altitude of only 5-25 m and thus merging with the background of the terrain; it would be dangerous to dive on it (after approaching the effective distance

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fire and shooting might not have enough headroom to get out of the dive); couldn't go downstairs...

However, in a competition with well-trained German pilots, strafing seemed to be of little help. "Before our eyes," O.D. Kazachkovsky, who then served as the head of intelligence in the 641st artillery regiment of the RGK, recalled similar cases at the beginning of the war on the Southern Front, "graceful, thin fighters [...] easily catch up and shoot down aircraft flying above us. [...] Then the same thing is repeated, and more than once. [...] These are German Messerschmitts shooting down our IL-2 attack aircraft"258. According to front-line pilot A.G. Nakonechnikov, during the summer battles of 1942 in the Stalingrad direction, attack aircraft, which "fled from the battlefield at low altitude", "suffered colossal losses, often losing

whole groups"?59. (True, against the background of the southern Russian steppe, aircraft flying at low level were also clearly visible, and the flat terrain made it easier for the Messers to pursue the IIs at the same ultra-low altitude. But, on the other hand, the same monotonous landscape and flat relief made it difficult for the Germans to determine the height - just like when flying over the surface of the water - and, therefore, increased the risk of crashing into the ground during an attack ...)

In general, an attempt to get away from fighters often not only did not improve the position of the "humped" (the speed of the B1109 was still much higher), but also worsened it. After all, flights at maximum speed were not practiced either in flight schools or in reserve regiments - and attack aircraft, led by young pilots, inevitably lagged behind the group. And the stragglers were doomed: the enemy attacked them first of all, and other "silts" could no longer help them ...

But in order to take the fight, the pilots of single-seat attack aircraft again lacked training. Since, according to the flight data, the IL-2 was hopelessly inferior to the fighters, they could only achieve any success in combat with the latter by interacting with each other. And for this, the "humpbacks" had to fly in a more or less dense

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build. Then - knowing that from other directions it was covered by neighboring aircraft - one or another pilot could turn on the Messerschmitt flying nearby and fire at it from wing cannons and machine guns (thus disrupting, perhaps, an attack on a neighbor ...). But the preservation of a dense battle order required good group flying! In 1941, there were relatively many pilots with more or less decent flying experience in the assault aviation regiments - but even then attempts to fight the "Messers" (maneuvering in the "front" formation) turned out to be unsuccessful. In 1942, the majority of attack pilots, as we have seen, were young people who had not been taught to fly in formation either at school or in the reserve regiment. Many did not even master the individual piloting technique properly! As a result, the battle formation ("link wedge" or "link bearing") was stretched, and after the first approach to the target, after a 180 ° turn, it completely disappeared: "I went there, but here, and I didn't see him again" ...260 It was no longer the "bearing of links", but an extended "chain" of separately flying aircraft that were unable to maintain any kind of fire interaction, departing from the target. Such separate Messer Schmitt planes were easily shot down, wedged into the gaps between them. The fragmentation of the group of attack aircraft also made it difficult for it to be covered by escort fighters (if there were any).

True, at the end of 1942, to carry out attacks, the "humpbacks" everywhere began to use a simpler battle formation - the "circle of aircraft". In it, every pilot should have -

it was necessary to maintain its place only relative to the aircraft flying in front (whereas during an attack from the "bearing of links" - also relative to those flying to the right and left). Instead of a sharp 180° turn for a new approach to the target, a smooth 360° turn was now performed. Therefore, during the strike, the system became easier to maintain. However, the attack aircraft leaving the attack still turned out to be defenseless: the one flying behind at that moment began to attack the target and, accordingly, ceased to cover the tail of the front

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him cars. There was also the problem of maintaining the formation when moving away from the target ...

In addition, until the end of 1942, attack pilots did not have any instructions on the tactics of combat of single-seat IL-2 with VNO9. Only in September 1942 did the command of the Red Army Air Force recommend a number of methods here. It was proposed, for example, to build a "defensive circle", where the tail of each attack aircraft was covered by the fire of cannons and machine guns flying behind. At the same time, by turning along the course, raising or lowering the nose of the aircraft, the PILOTS of the "silt" could also drive away the fighters approaching the "circle" with fire. When moving away from the target, it was recommended to use such an anti-fighter maneuver as a "snake", i.e. leave along a wave-like trajectory, alternately laying either a right or a left turn. This made it difficult for the German pilots to aim: after all, both the course and the angular velocity of the target were constantly changing. In addition, leaving the "snake", the attack aircraft pilot could better than flying in a straight line, view the rear hemisphere (the single-seat IL-2 had a very poor rear view; it was provided only by two "windows", which, according to G.F. Siv kova, "were always smeared with something"?61). Large groups of attack aircraft could use "scissors", i.e. leave in two "snakes" separated by a height of several tens of meters and not coinciding with each other in the phases of the turns - so that the planes from different "snakes", like the ends of scissors, then approached, then diverged ... If, however, a single attack aircraft was attacked by a fighter, he should have slipped out from under it - knocking down the German's aim - or laying a turn. In the latter case, the high-speed BOO09, which could not turn around as sharply as the low-speed IL-2, inevitably broke away from the attack aircraft and could even lose sight of it. Finally, when attacking the Messer from behind, the pilot of a single IL-2 could sharply slow down - so that the German would jump forward and come under fire from the wing cannons and machine guns of the "humpback".

It is not difficult, however, to see that all these methods are again

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they still required good individual piloting technique and good group flying ... The fact that "attack aircraft are not yet trained everywhere to conduct defensive air combat with the widespread use of "circle", "KI kites" and "scissors"" was noted even nine months later, in the directive of the commander of the Red Army Air Force of July 7, 1943²⁶²

True, in 1943, with the displacement of the single-seat Il-2 by two-seat, it finally became possible to use tactics in the fight against fighters that had long been successfully used by the German L187 - the same single-engine two-seat machines with a rear firing point. This tactic consisted both in maintaining a tight, compact formation by a group of attack aircraft, and in mutual cover for each other with the fire of tail machine guns, i.e. in concentrating the fire of as many gunners as possible on the most dangerous fighters attacking the group at the moment. Such a concentration of fire could partly compensate for the insufficient training of each individual air gunner; while maintaining fire interaction, the limited angles of fire of the UBT machine gun, noted above, ceased to be of great importance. If the gunner of an attack aircraft attacked at a high angle from the side or from above was not able to turn his machine gun towards the attacking fighter, then the gunners of the aircraft flying in formation in front of him could easily do this. The compactness of the combat order of the group just ensured the maintenance of such fire interaction. |

However, the deplorable situation with the training of attack aircraft pilots, which developed in 1941-1942, persisted, as we saw, in the first half of 1943 - and many still did not know how to fly in formation ... This circumstance was back in the spring - summer of 43⁶³. And the fate of aircraft flying separately, "falling out" of the system of fire interaction, immediately began to affect and not

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the experience of the shooters, and the design flaws of the rear shooting point. It was precisely the inability to maintain a tight formation that explained the above-described cases of the defeat in the first days of the Battle of Kursk of entire groups of two-seat Il-2s that found themselves without fighter cover - as well as cases of 100% extermination of groups of attack aircraft during strikes against German airfields in the Oryol ledge and Donbass 5— May 8 and June 8-10, 1943 (for example, on May 7 and June 8, even groups consisting of 12 Il-2 each were completely shot down - the first of the 58th and 79th Guards Assault Aviation Regiments of the 2nd Guards Assault Air Division from the 16th Air Army of the Central Front, and the second from the 614th Regiment of the 225th Division of the 15th Air Army of the Bryansk Front? There was one more thing

the phenomenon noted in the directive of July 7, 1943 (and also due to the insufficient training of the crews) is poor observation of the air. Inexperienced pilots obviously focused all their attention on driving the machine - and, naturally, often did not notice the Messers or Fokkers approaching at high speed. And the shooters, as noted above, were not taught caution in the air even in the 44th ...

The rear continued to supply undertrained pilots in 1944-1945, and cases of loss of the IL-2 due to insufficient group flying occurred at the end of the war. So, in March 1945, during the East Prussian operation, the attack aircraft of the 1st Air Army of the 3rd Belorussian Front still sometimes went astray due to "stretching groups" during the battles with E! 190265. However, in the front-line units, the development of group flying in 1944-1945 began to pay much more attention than before, and the increase in the second half of 1943 in the regiments of the layer of experienced pilots greatly facilitated the achievement of good results here. And they were finally reaching you! "Sturmtroopers," states W. Schwabedissen, speaking of the last period of the war, "strongly kept the formation"266. In addition, as already noted, in 1944-1945. IL-2 began to operate more often in large groups - 12-36 and even

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54 aircraft. It was incomparably more difficult for Messers and Fokkers to attack such groups: the increased density of fire from heavy machine guns sharply increased the probability of shooting down an attacker. In the last period of the war, the battle formations used by the "humped" on the route to the target and back were also improved. Groups could line up, for example, in a "ladder of links", in which each link flew lower than the previous one, thereby protecting it from attacks from below - more frequent, as we remember, after equipping the IL-2 with a tail machine gun ... When the situation changed, the groups changed and their battle lines. |

As a result, the Germans admit, "the only really effective tactic for German fighters" in the fight against the IL-2 in 1944-1945. "there was only a sudden attack"...267

V.I. Perov and O.V. Rastrenin reasonably point out another factor that influenced the decrease in the second half of the war of IL-2 losses from fighter attacks - the deterioration, starting from 1944, of the training of German fighter pilots?68. However, the importance of this factor should not be exaggerated. In January 1945, skillfully using surprise attacks, the Messerschmitts operating in the sky of Hungary destroyed from 14.2 to 18% of the attack aircraft available in the 17th Air Army of the 3rd Ukrainian Front on January 1 (out of 372 aircraft, 53 became the victim of the "Messers" for sure, and 14 - the causes of death of which remained unknown -

presumably)?269. "There were a lot of our fighters in the air," recalls G. G. Cherka Shin, who fought in the 672nd assault aviation regiment of the 306th assault air division, but the Germans "caught the moment, jumped out of the clouds, cut off from the extreme groups and shot down"? 70. According to veterans, in the 154th Guards Assault Aviation Regiment of the 307th Assault Aviation Division of the 2nd Air Army of the 1st Ukrainian Front at the end of the war, there were even more losses from fighters than from anti-aircraft guns? 1.

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7. CONCLUSION

Summing up the overall result, let us single out the main thing once again: the effectiveness of the operations of Soviet attack aviation in 1941-1945. was significantly lower than depicted in domestic literature, published until the end of the 90s. And the conclusion of F. von Mellenthin that "the effectiveness of Russian aviation did not correspond to its numbers" is quite true for Soviet attack aircraft. They could have a noticeable impact on the course of hostilities only due to the fact that they were used in huge quantities. Yes, and this influence was not so much in the destruction of the enemy's manpower and equipment, but in the exhaustion and demoralization of German soldiers and officers who were subjected to continuous raids by attack aircraft.

Firstly, the effectiveness of Il-2 bombing attacks was incomparably lower than it is commonly believed in our country. Willingly or unwillingly, domestic historians and publicists turned out to be victims of unreliable sources here - crew reports, reports and reports of Soviet aviation commanders and headquarters, testimonies of prisoners of war ... This low performance will become clearer if we consider that another common place of our Literature - the thesis about the supposedly incomparable combat qualities of the Il-2 attack aircraft, about the ideal suitability of this aircraft for direct support of troops on the battlefield - is also a myth. Unstable, lacking effective sights and deprived of the ability to strike from a steep dive, the Ilyushin attack aircraft turned out to be insufficiently adapted to effectively destroy ground targets. Presented as the main advantage of the IL-2 armor for 1941-1945. was also already insufficient - and did not save these "flying tanks" from being destroyed in huge numbers by German fighters and anti-aircraft gunners. The IL-2 and its semi-wooden construction, which further reduced the combat survivability of this machine, made the IL-2 by no means an ideal "battlefield aircraft".

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In addition to the insufficiently perfect materiel, the effectiveness of the strikes of the Soviet ground attack aviation was also reduced by numerous flaws in its tactics. The main ones were:

- a) preference for strikes from a shallow dive, few aimed strikes from a strafing flight;
- b) poor planning and combat support for strikes (in 1941-1943);
- c) the practice of strikes with small forces (in 1941-1943) and
- d) short time of impact on the target during the strike (in 1941-1942).

In turn, the tactical weakness of the Soviet assault aviation was determined by the poor level of training of its commanders - back in 1943, they frankly neglected the basics of tactical art and refrained from any detailed planning of strikes.

Finally, the low effectiveness of the Il-2 strikes was determined by the poor flight, shooting and tactical skills of ordinary pilots. As in other types of aviation, it was due to the downright criminal attitude of the Soviet command to the organization of pilot training: throughout the war, attack pilots arrived at the front undereducated, if not practically untrained. In the first and second periods of the war, the weakness in the training of the bulk of pilots was also determined by the vicious organization of the recruitment of front-line air units that existed until mid-1943, which complicated the commissioning of young replacements into service and the transfer of combat experience to them.

Secondly, the effectiveness of the actions of the Soviet attack aviation was reduced by the low intensity of the use of its numerous aircraft fleet, due to the organizational miscalculations of the Soviet command. Insufficient ability to organize an airfield maneuver, lack of material and technical support, in 1941-1942. and the low qualification of the technical staff of the attack air units - all this led to the fact that the Il-2 aircraft were used in

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several times less intensive than the relatively few machines of the German attack aircraft - 187 and E \! 190E

Thirdly, the effectiveness of the IL-2 cannot be called high because of the too high - much higher than in the German attack aviation - the level of combat losses. This level was partly determined by the same factors as the lack of effectiveness of

ditch - tactical illiteracy of the Soviet aviation command in 1941-1943, poor flight, shooting and tactical training of pilots and air gunners - which prevented them from successfully resisting German fighters and anti-aircraft guns - as well as the not so perfect design of the "armored attack aircraft" IL-2. The high level of training of German fighter pilots and anti-aircraft gunners also had an effect, and in 1941-1943. and tactical miscalculations of the Soviet fighters accompanying the attack aircraft.

It should be noted that in the course of the war the effectiveness of the actions of Soviet attack aviation constantly increased due to the improvement of the control of the actions of attack aviation and the tactics of attack aircraft and escort fighters, as well as - after a change in the middle of 1943 of the system for recruiting front-line air units - to improve the training of pilots - attack aircraft. In 1944-1945. "the effectiveness of the solution by attack aircraft of the tasks of direct air support of troops in comparison with 1941-1942. increased by about 6-8 times"⁷². However, the level of 1941-1942 was so low that this circumstance does not change our final assessment.

Note that the IL-2 turned out to be the most massive aircraft of the Soviet Air Force during the war years - for 1941-1945. 36,154 of them were issued?⁷³. In this regard, the question arises: why did the USSR continue to produce the insufficiently efficient IL-2 aircraft in ever-increasing quantities and actually set a course for the partial replacement of bomber aircraft with attack aircraft? After all

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the same Pe-2 dive bomber made it possible to provide much greater accuracy of bombing ... In general terms, this was answered by the commander of the Red Army Air Force in 1942-1945. A.A. Novikov. Firstly, a single-engine and simple attack aircraft was simpler and cheaper to manufacture than twin-engine all-metal bombers. Secondly, the IL-2 proved to be more all-weather than the bombers: did they attack mainly from low altitudes and, therefore, could operate even in low clouds?"⁷⁴. Let's add to this that the IL-2 - in particular, compared to the same Pe-2 - was easy to fly; in conditions when the bulk of front-line pilots were very poorly trained, this was of great importance ... Under these conditions, one of the modern authors notes, the cheapness of the attack aircraft became an even bigger plus: to allow poorly trained pilots to ruin expensive and difficult-to-produce -2 would it be too expensive?⁷⁵.

The confessions of A.A. Novikov and the observations of modern authors highlight all the same weaknesses of the Soviet Union that made it difficult for him to conduct an air war

against Germany. This is, firstly, the relative weakness of the Soviet aircraft industry, which was unable to ensure the production of a large number of two- and multi-engine strike aircraft. This, further, is the "quantitative thinking" of the Soviet leadership, which actually sought to beat the enemy not with skill, but with numbers - not with a relatively limited number of highly efficient dive bombers with well-trained crews, but with huge masses of insufficiently effective, but simple and cheap aircraft with hastily trained pilots. Therefore, M. Pavlovsky's remark that neither the Germans, nor the British, nor the Americans needed an Il-2 type aircraft (and, therefore, let's add, attack aircraft in its Soviet version) seems to be quite fair⁷⁶. With regard to the Germans, this thesis will be substantiated in the chapter TU, and as for the Anglo-Saxons, then in the hands of their well-trained pi

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lots, even non-specialized aircraft that served as attack aircraft - the Typhoon, Tempest, Mustang and Thunderbolt fighters - turned out to be more effective than the specially designed Il-2 attack aircraft ... In general, Soviet attack aircraft 1941-1945 gg. - this is flesh and blood from the blood of the Soviet social, political and economic system, this is the Soviet Union of the war years in miniature.

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68 Perov V., Rastrenin O. Sturmovik IL-2. S. 11.

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del", she was supposed to get 9 more tanks. There should have been about 100 armored personnel carriers in two motorized infantry regiments of the division (See: Zamulin V.N., Lopukhovskiy L.N. Prokhorovskoe battle. Myths and reality // Military-historical archive. 2002. No. 9. P. 58; No. 11.S.46). Judging by the fact that only 15 tanks were allocated to replenish the advancing troops of the entire Army Group "South" on July 13 (Ibid. 2003. No. 3. P. 90), on July 5-6 the division was not replenished with tanks and self-propelled guns (or received five of them, no more). Consequently, if you believe the Soviet reports, on July 1st, the II-2 destroyed with one blow (recall that the losses from the PTAB hit were usually irretrievable) about 70% of all Totenkopf armored vehicles! However, by 6 p.m. on July 11, according to reports from its headquarters, this division had 122 combat-ready tanks and self-propelled guns (Ibid. 2003. No. 1. P. 105), i.e. not 30%, but 70% of the fights available at the beginning. At the same time, far from all those who were out of action were lost forever (such losses usually accounted for only an absolute minority of the total combat losses of tanks and self-propelled guns ...) Of course, some part of the victims of the July 7 air strike could be cars, but, most likely the low quality of photographs, which is usual in such cases, left wide scope for arbitrary assessments of the impact result.

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160 Morozov M. Sink them all?! Air Force of the Black Sea Fleet in the operation to liberate the Crimea // History of Aviation. 2000. No. 6. S. 17.

161 See: Shvabedissen V. Decree. op. S. 294.

162 Khazanov D. Battle over the Jassy. S. 27.

163 Perov V., Rastrenin O. Sturmovik Il-2. S. 35.

164 Ibid. pp. 35, 68.

165 Ibid. S. 76.

166 Drabkin A. Decree. op. S. 96.

167 Ibid. S. 76.

168 Ibid. pp. 49, 210, 248.

169 Op. Quoted from: Vasilevsky A.M. The work of a lifetime. Book. 2. M., 1988. S. 168.

170 Efimov A.N. Decree. op. S. 243.

171 Calculated from: D. Khazanov. Battle over Iasi. S. 26, 30, 32.

172 Calculated according to: Gorbach V. Decree. op. S. 483.

173 Calculated according to: Zefirov M.V. Decree. op. P.62-120; Zefirov M.V., Degtev D.M. Decree. op. pp. 345-589. The uncertainty of information is due to the incompleteness of data on the number of sorties,

performed by some Soviet pilots. Yes, survivors

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war V.V. Gamzin (who completed 447 sorties by mid-July 1944), L.M. 495 were scored) until May 9, 1945, they could well have crossed the line of 500 sorties, and N.V. Ivanov (who had completed 371 sorties by November 1944) - 400 sorties. This last bar could have had time to step over and the one who died on July 6, 1944. B.S. Okrestin (who had 381 sorties behind him in January of the same year). And A.V. Poklikushkin, who died on March 18, 1945 - by February 1944, made 692 sorties - probably managed to overcome the milestone of 700 sorties.

174 Zefirov M.V., Degtev D.M. Decree. op. pp. 348-360; Great Patriotic War 1941-1945. Encyclopedia. M., 1985. S. 108, 211, 427, 475, 507, 550, 651, 688, 779; Zefirov M.V. Decree. op. pp. 160-161, 311, 352, 452, 455.

175 Great Patriotic War 1941-1945. Encyclopedia. P. 176: Zefirov M.V., Degtev D.M. Decree. op. pp. 349, 440, 441, 442; Zefirov M.V. Decree. op. pp. 120, 148, 152, 156, 266, 273, 305, 308, 352, 444.

176 Zefirov M.V., Degtev D.M. Decree. op. pp. 345, 347, 351, 353; Zefirov M.V. Decree. op. pp. 78, 88, 91, 130, 147, 148, 334, 344, 441, 443.

177 Zefirov M.V., Degtev D.M. Decree. op. P. 351, 353, 358, 360; Zefirov M.V. Decree. op. pp. 88, 102, 104, 207, 208.

178 Kurbatov Yu. "War is not fireworks at all..." // Behind Kaluga Stava. No. 16 (101). April 29 - May 5, 1999. P.6.

179 Zefirov M.V., Degtev D.M. Decree. op. S. 349; Zefirov M.V. Decree. op. pp. 156, 246, 249, 310, 336, 383, 405.

180 See: Efimov A.N. Decree. op. S. 232, 300; Soviet military encyclopedia. In 8 vols. 2nd ed. T. 1. M., 1990. S. 342; Zefirov M.V. Decree. op. S. 90.

181 Zefirov M. V. Decree. op. pp. 115, 246, 30.

182 Perov V., Rastrenin O. Sturmikov II-2. S. 101.

183 Ibid. pp. 16, 68, 81, 96; Gorbach V. Decree. op. pp. 97, 136; Efimov A.N. Decree. op. S. 70.

184 See note 6 to chapter M.

185 Calculated according to: Khazanov D. Battle over the Jassy. S. 20, 30.

186 /vabedissen V. Decree. op. pp. 191, 193, 299.

187 Ibid. S. 91.

188 Ibid. S. 94.

189 Ibid. S. 198.

190 Lipfert V. Diary of a Luftwaffe Hauptmann. 52nd Fighter Squadron on the Eastern Front. 1942-1945. M., 2006. S. 84.

191 Ignatiev G.V. Decree. op. S. 170.

192 Calculated according to: Perov V., Rastrenin O. Sturmikov II-2. S. 76, 81; Russian archive. The Great Patriotic War. T. 15 (4-4). S. 379.

193 Op. Quoted from: Perov V., Rastrenin O. Shturmikov II-2. P. 1 (memorandum of the aircraft designer S.V. Ilyushin dated January 27, 1938).

194 Chernikov E. Decree. op. Scheme on p. 18; Perov V., Rastrenin O. Shturmikov IL-2. pp. 17-18.

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195 Ibid: Toliver R.F., Constable T.J. The best ace of World War II. M., 1999. P. 140. |

196 Efimov A.N. Decree. op. pp. 163-164.

197 Ibid. pp. 58-59, 114.

198 See: Shvabedissen V. Decree. op. pp. 102, 199, 304.

199 Toliver R.F., Constable T.J. Decree. op. pp. 81, 138.

200 Perov V., Rastrenin O. Sturmovik IL-2. S. 17.

201 Quoted from Chernikov E. Decree. op. S. 14.

202 Toliver R.F., Constable T.J. Decree. op. S. 141; Spik M. Aces backlash waffe. Smolensk, 1999, p. 133.

203 Khazanov D.B. Unknown battle in the skies of Moscow. 1941-1942 defensive period. S. 97; Shvabedissen V. Decree. op. S. 102.

204 [lit. Quoted from: Khazanov D. Werner Melders // Aviamaster. 1997. No. 4-5. S. 33.

205 [//Vabedissen V. Decree. op. S. 102.

206 Perov V., Rastrenin O. Sturmovik IL-2. P.596.

207 Ibid.

208 Chernikov E. Decree. op. P.20.

209 Perov V., Rastrenin O. Shturmovik IL-2. P.96.

210 !/vabedissen V. Decree. op. S. 199.

211 killian H. In the shadow of victories. German surgeon on the Eastern Front. 1941-1943. M., 2005. S. 119.

212 Efimov A.N. Decree. op. S. 333.

213 Perov V., Rastrenin O. Sturmovik IL-2. pp. 39, 88; Chernikov E. Decree. op. S. 12.

214 Quoted from: Chernikov E. Decree. op. S. 26.

215 Ibid. S. 20; Shavrov V.B. Decree. op. S. 243.

216 [//Vabedissen V. Decree. op. S. 102; Damn a dozen aces of the Luftwaffe. Mn., 2000. S. 189-190.

217 Schwabedissen V. Decree. op. S. 102.

218 Calculated according to: Perov V., Rastrenin O. Sturmovik IL-2. S. 37, 68, 95, 101. -.

219 Ibid. S. 96.

220 Ibid. pp. 95-96.

221 Ibid. P.96.

222 Ibid. P.95-96.

223 Shvabedissen V. Decree. op. S. 94.

224 Ibid.

225 Op. by: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. T. 1.S. 123.

226 | it, according to: Chernikov E. Decree. op. P.20.

227 Perov V., Rastrenin O. Stormtrooper IL-2. pp. 95, 101; Alekseenko V. Soviet Air Forces on the Eve and During the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3. P. 8.

228 Note that the increase in the number of sorties by one irretrievable combat loss of the IL-2, which took place in the third period

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war, was, apparently, not so significant (from 26 to 85-90), as indicated by V.I. Perov and O.V. Rastrenin. So, it can be assumed with a fair degree of certainty that in 1944 this number was still less than 85 (from which figure Perov and Rastrenin proceed, deriving the average value of the indicator for the entire war (Perov V., Rastrenin O. Sturmovik IL-2, pp. 99, 101). After all, the number 85 characterizes the situation "as of November 1, 1944." (Ibid., p. 101) - so it is not clear to what period of time it refers (is it the same day as November 1, 1944?). I.I. Pstygo points out that in 1944 IL-2s made up to 70 sorties for one combat loss (Chernikov E. Decree op. C. 43) ... For January - early May 1945, this figure is also should have been significantly less than 90. After all, this last figure was derived for the period from January to September 1, 1945 - and the level of combat losses of the IL-2 during the August campaign against Japan was about two lower than during the winter and spring battles on the Soviet-German front.

229 Rastrenin O. Main strike force. S. 324.

230 Calculated according to: Perov V., Rastrenin O. Shturmovik IL-2. S. 101.

231 Ibid. pp. 44, 55.

232 By the summer of 1943, Pi! 109s were flying on the Soviet-German front! groups of the 3rd Fighter Squadron, Ni-Sh of the 5th group, 1, Pi Sh-groups of the 52nd and N-group of the 54th, ana R \ M / 1 90 - | group of the 26th, |, Shi Mgroups and the 6th detachment of the I group of the 51st fighter squadron and 1! group of the 54th. In the autumn of 1943 - in the winter of 1944, the Messerschmitts fought there Ni groups of the 5th fighter squadron, M group of the 51st 1, Ni! groups of the 52nd, ana "Focke-Wulf" - 1, Shib-th detachment And groups of the 51st fighter squadron and |, Pi Mgroups of the 54th.

From the spring of 1944, fighters [V190] flew only on the Soviet-German front | and the N-groups of the 54th fighter squadron and the headquarters detachment of the 51st (in July - early September - also the M-group of the 54th and, for a short time, the III-group of the 11th). On B1109, they fought P (until May), 1! (until November) and M (in October) groups of the 5th fighter es cadres, |, I (since October), Shi! .

233 See: Perov V.I., Rastrenin O.V. Shturmovik IL-2. P. 82: They are. Assault aircraft of the Red Army. T. 1. S. 201 (bottom diagram)

ma). The fighter submodifications of the RV190A-5 aircraft did not differ either in flight characteristics or in armament from the RM/190A-4, whose capabilities in the fight against the IL-2 characterize V.I. Perov O.V. Rastrenin.

234 Perov V., Rastrenin O. Sturmovik Il-2. S. 54.

235 Ibid. S.52, 54.

236 Ibid. S. 54; Drabkin A.S. 102, 188.

237 Op. Quoted from: Chernikov E. Decree. op. S. 23; see also: Efimov A.N. Decree. op. S. 159.

238 Op. Quoted from: Rastrenin O. The main striking force. S. 358; Gorbach V. Decree. op. S. 199.

239 Efimov A.N. Decree. op. S. 217.

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240 Drabkin A. Decree. op. S. 181.

241 Op. Quoted from: Perov V., Rastrenin O. Sturmovik Il-2. S. 47.

242 Drabkin A. Decree. op. S. 193.

243 Calculated according to: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. T. 1. S. 201, 202.

244 Perov V., Rastrenin O. Sturmovik Il-2. S. 95; Shvabedissen V. Decree. op. S. 293.

245 During the entire campaign of 1941, four groups of the 51st fighter squadron operated on the Soviet-German front, three of the 52nd, three of the 54th and 1 1/3 (Shruppai and 14th Detachment) - the 77th. In addition, three groups of the 3rd, three of the 53rd and 1st groups of the 77th Fighter Squadron fought there until December; until November - the 1st detachment of the 77th; until mid-October - the headquarters detachment and the 27th Shgroup; until mid-September - the 13th detachment of the 77th, and at the beginning of July - the INgroup of the 27th.

During the whole of 1942, three groups of the 52nd Itri fighter squadron - 54th operated on the Soviet-German front. From the composition of the 5th Fighter Squadron in January-February there was a single group fighting there, in March - one or two, and in April - December - two; from the 51st in January - July and September, four fought in the East, in August - three or four, in October - three, in November - two three and in December - 3 1/3 groups (1, Sh, Mib-yY detachment and groups). In addition to them, in January - February, one group operated there, in March - one or two, and in April - October - two groups of the 77th fighter squadron; in May - two or three, in Avi June - December - three groups of the 3rd and, at the end, in June - September - one group of the 53rd.

During the whole of 1943, two groups of the 5th fighter squadron, 3 A of the 51st group and three of the 52nd operated on the Soviet-German front. From the 54th fighter squadron in January and August - December, three fought, in February - March - one or two

April-August - two groups. In addition to them, in January three groups of the 3rd fighter squadron fought on the Soviet-German front, and in February - August - two groups of the 3rd fighter squadron, in February - May - one group of the 26th.

During the whole of 1944, three groups of the 52nd Fighter Squadron were active in the Soviet-German battle. From the composition of the 51st vyvan var - September 3 1 / z fought there, in October - December - 4 1 / . groups; from the 54th in January - June and September - December, two groups fought, in July - August - three groups. In addition, in January - April and October, two groups of the 5th fighter squadron operated on the Soviet-German front, in May - one or two, in August - September - one group of the 5th fighter squadron, in October - December - one group of the 53rd, and at the end of June - July - one group 11th.

246 Calculated according to: Medved A.N. Focke-Wulf E\190. M., 1993. S. 56.

247 Aces of the Luftwaffe. RM/190 pilots on the Eastern Front. Part 2. Riga, 1997.S. 24.

— See: Perov V., Rastrenin O. Sturmovik IL-2. P.595. 249 Shvabedissen V. Decree. op. pp. 95, 101. Since, according to Soviet sources, the phenomena noted by Schwabedissen for

1ZA. Smirnov 385

1941 were preserved in 1943, it is logical to assume that they existed in 1942.

250 Russian archive. The Great Patriotic War. T. 15 (4-4). S. 44.

251 Ibid. S. 45.

252 Perov V., Rastrenin O. Sturmovik Il-2. pp.77-78, 80-81.

253 See: Ignatiev G.V. Decree. op. pp. 132-136, 161-177.

254 //vabedissen V. Decree. op. S. 293.

255 Smolnikov F.M. Let's fight! Diary of a veteran. Letters from the front. M., 2000. S. 261-262.

256 Drabkin A. Decree. op. S. 241.

257 Shvabedissen V. Decree. op. S. 96.

258 Kazachkovsky O.D. Physics in the war. M., 1999. S. 65.

259 Op. Quoted from: Perov V., Rastrenin O. Sturmovik Il-2. S. 44.

260 Ibid. S. 46, 18.

261 Op. Quoted from: Chernikov E. Decree. op. S. 14.

262 Russian archive. The Great Patriotic War. T. 15 (4-4). S. 45.

263 Ibid. |

264 Rastrenin O. The main striking force. pp. 363-364.

265 Ignatiev G.V. Decree. op. S. 197.

266 Vabedissen V. Decree. op. S. 298.

267 Ibid. pp. 298-299.

268 Perov V., Rastrenin O. Sturmovik Il-2.S.595.

269 Isaev A., Kolomiets M. Hitler's last counterattacks. The defeat of the Panzerwaffe. M., 2010. S. 31, 167.

270 Drabkin A. Decree. op. S. 224.

271 Ibid. P.70.

272 Rastrenin O. Main impact force. S. 401.

273 Perov V., Rastrenin O. Sturmovik Il-2. S. 101.

274 Novikov A.A. Decree. op. S. 302.

275 Difficult question // Aviamaster. 1998. No. 2-3. S. 56.

276 Pavlovsky M. Decree. op. S. 37.

Chapter M

COMBAT WORK OF THE GERMAN ATTACK AVIATION

In the Luftwaffe, the main "battlefield aircraft" at first was the Junkers La87 dive bomber, which the Germans also called the "Stuka" (short for "Sturzkampfflugzeug" - "dive bomber"), and in 1944 - the assault version of the Focke fighter -Wulf E \! 190 "- E \! 190E In addition, in small

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123 Henschel H \$ 123 and H \$ 129 attack aircraft, Messerschmitt B109E fighters and an E \ Y! 190S fighter bomber were used; in fact, as "battlefield aircraft" were used (in 1941-1943) and twin-engine fighters "Messerschmitt VI 10".

1. WAS THE LOSS OF "OBSOLETE" 4087s GREAT?

The disdainful assessment of the L187 dive bomber was in our literature as common as the praise

attack aircraft Il-2. The obsolescence of the "lappet" (as the L187 was called in the Red Army for the characteristic shape of the fairings of the non-retractable landing gear), its low speed, weak defensive armament, insufficient armor were constantly emphasized ... This aircraft, Russian authors argued, "was good only in places poorly protected by anti-aircraft defense systems, and in the absence of fighters covering ground troops. On the Soviet-German front, L-87s suffered heavy losses [...]".

Let us first dwell on the thesis about the "big losses" of the "lappeters". In 1943-1944, when the air defense of the Soviet ground forces was significantly strengthened and the number of Soviet fighter aviation increased sharply, cases of the defeat of entire groups of L187 actually appeared. Thus, in June 1943, according to German data, Red Star fighters managed to shoot down or seriously damage exactly half of the 36 "Stukas" of the P group of the 1st dive squadron, which raided the Kursk2 railway station. However, one cannot ignore evidence to the contrary. So, recalling the sorties to bomb the bridge across the Tim River (east of Kursk) in April 1943, the former commander of the III group of the 1st dive squadron F. Lang emphasized that L187 "almost every time they met strong anti-aircraft fire and fighters. The Russians had a well-organized advance warning service. Soon after the start, we heard in our

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nicknamed a message in Russian about our departure. However, despite all this, during these sorties we did not suffer any losses. The usual exaggeration of a memoirist? But here is a source of a different kind - the reports of the service of the Quartermaster General of the Luftwaffe, containing the most complete data on the losses of the 2nd and 77th dive squadrons during Operation Citadel - the offensive of the Wehrmacht on the Kursk Bulge in July 1943 throw our traditional ideas about the scale of the losses of the "lappet" on the Soviet-German front ...

In fact, the air defense of the Voronezh Front, on whose troops both squadrons fell upon, can by no means be called weak. As of July 1, the front had 761 anti-aircraft guns, which made it possible to cover over 60% of the area occupied by the combat formations of the troops - the main targets of L187 strikes - with multi-layered anti-aircraft artillery fire. In the 2nd Air Army of the Voronezh Front, by the beginning of the Tsi Tadel, there were 597 Yak-1, Yak-7Bi La-5 fighters. True, due to the lack of combat-ready pilots, only about 400 aircraft could be brought into battle, but there were even fewer fighters in this direction - 153. -I air army which had 255 Yak-1, Yak 7B and La-5 (including approximately 180 combat-ready)>. And so

no less than on the first day of the operation, July 5, the 2nd and 77th peaks of the leveling squadrons, having made 1071 sorties, irretrievably lost only 4 "Pieces"! (For comparison: the assault air units of the 2nd Air Army, in just 220 sorties, irretrievably lost that day, according to Soviet data, 27 Il-2, i.e. one plane was lost in them already in 8 sorties, while in German squadrons - in 268!) On July 7, both squadrons completed 746 sorties - and only one aircraft had to be written off! On other days of the Citadel, the level of irretrievable losses of the Stuka was higher - for one such loss there were no longer 746 or 268 sorties, but 132 (on July 6, when 6 machines were written off after 793 sorties), 116-117 (Zee on July 9 when on respectively 701

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and 699 sorties accounted for 6 decommissioned "Pieces"), about 100 (July 10, when about 300 sorties cost 3 decommissioned cars) and even 74-75 (July 11, 6 "Pieces" were irretrievably lost in just 447 sorties). But on July 12, having completed 150 sorties, the dive bombers of the 2nd and 77th squadrons did not lose a single aircraft at all, and in general, during the first week of the Battle of Kursk (July 5-12, 1943), only one L187 was irretrievably lost in these formations in about 153 sorties⁶ - while one Il-2 in the 2nd Air Army on July 5-10 - in only 16-17! In other words, the level of losses of the IL-2 in the 2nd Air Force turned out to be an order of magnitude higher. Av9-th mixed air corps of the 17th air - two orders of magnitude! At that time, only 2.2 sorties were accumulated in his 305th assault air division for one irretrievable combat loss: in three days the division lost two-thirds of its vehicles - 61 Il-2 - in 137 sorties, and on July 8 it was withdrawn to the rear for reorganization. The 306th assault mission was also sent there for an irretrievable combat loss (for three days in [77 sorties, it lost 56 Il-2)⁷.

It is noteworthy that the operation "Citadel" turned out to be even more "safe" for the "lappeters" than the air battles that took place in the spring of the 43rd air battles in the Kuban. However, even there, attacking on April 17, 1943, the Soviet bridgehead near Myskhako near Novorossiysk (the famous "Malaya Zemlya"), L187, despite the "dense", according to the pilots, anti-aircraft fire, lost only 7 in 494 sorties aircraft. Thus, for one irretrievable combat loss, there were about 70 sorties - while at. IL-2 in August 1942 - May 1943, an average of only 26 were recruited ...

Meanwhile, the Battle of Kursk continued; On July 12, Bryansk and the left wing of the Western Front—which the Central Front joined on July 15—launched the Oryol Offensive. By its beginning, in the 1st, 15th and 16th air armies of these fronts, there were 1141 fighters!

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Xia only in 148-149 sorties, on July 19-23 - in 124-125, and on July 1 - August 5 - in 216!11

Surprisingly low is the level of losses of "pawmen" in the last year of the war. So, during the German-Romanian offensive near Iasi on May 30 - June 8, 1944, L187, according to the Soviet VNOS posts, made 45% of all enemy aircraft sorties (and 9544 of them were marked), i.e. completed at least 4,300 sorties (no less - since Soviet observers did not record all sorties; the Germans alone then made 10,498 sorties)! "Air battles between a squad of dive bombers and a Soviet group of 15-30 R-39, La-5 or Yak-9," H.U. (On October 18, 1943, dive squadrons were renamed assault squadrons) - they were not uncommon, but commonplace. In them, Russian pilots demonstrated exceptional aggressiveness and showed much better qualities than before! Against 584 fighters available to | June, in the 5th Air Army of the 2nd Ukrainian Front, which was operating in the Yassk direction, the Germans and Romanians could field only 19914. Nevertheless, in eight days of fighting, the Luftwaffe lost only 7 Stukas (from the III group and 10 th (anti-tank) detachment of the 2nd assault squadron) ... True, only on May 30-31 did not less than four lose the 6th group of dive bombers of the Romanian Air Force. But even if we assume that before June 8, the Romanians lost twenty L187s, then even then there will be about 160 sorties for one Stuka irretrievably lost by the enemy. And if we refuse to average and take only German units and subunits, then this number will turn out to be much larger! Note that in the Soviet Air Force, for one irretrievable combat loss of the Il-2, even in 1945, there were no more than 90 sorties, and in 1944 - about 70 ... 16

Another thing is that the insignificant (by Soviet standards) losses suffered by L187, for example, in 1943, were considered by the Germans themselves as unacceptably large. Here

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it must be taken into account, firstly, that by the beginning of the same operation "Citadel" "Stuk" on the entire Soviet-German front there were only about 425-435. And the Luftwaffe as a whole, apparently, never had more than 550 L18717 in combat units. And secondly, the Germans highly valued their flight personnel! Only with these two circumstances in mind can one evaluate the well-known statement of the Luftwaffe ground attack aircraft inspector E. Kupfer, which we cite as proof of the exorbitant losses of Lie87! 8. "Junkers-87", - said in September 1943 under Colonel Kupfer, - can no longer be used on any

one theater, even in the East. For example, my squadron [2nd dive squadron. - A.S.] lost 89 crews in eight months. In terms of a year, this corresponds to a 100% renewal of the flight crew" 9.

Only the German command could be guided by such logic! If the Soviet reasoned in the same way, then it would inevitably have come to the conclusion that it was impossible to use the Il-2 attack aircraft! Indeed, on average, the fleet of these aircraft in the active army was renewed by 100% every 7-8 months of the war? And in a year, the percentage of renewal even in the 43rd, and in the 44th reached 150-200! On | On January 1, 1943, the active army had about 1800-2000 Il-2s, and on January 1, 1944 - 241321. Their combat losses in 1943 amounted to about 3760 vehicles (3515 were lost by the Red Army Air Force and about 240 by the Navy Air Force), and in 1944 - about 3660 (3344 army and about 320 naval) or - if we accept the data of V.I. 404022. It is true that fewer crews perished than aircraft (an average of 1.35 times over the war?3), but one can speak of a 100% renewal in a year here as well.

But, as you know, the Soviet command did not consider losses - and did not raise the issue of the impossibility of further use of the Il-2 ... Kupfer believed that losing flight personnel at the same rate as the Soviet Air Force was absolutely unacceptable - and therefore demanded

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"Immediately" start replacing L187 with E\!190. "Since July 5, 1943," he emphasized, "I have lost two squadron commanders, six squadron commanders and two group adjutants, each of whom made more than 600 sorties. Such an experience cannot be replaced... We cannot afford to lose those few who remain"?4.

Nevertheless, L: 187 continued to be actively used even in 1944 ...

2. WAS IT EASY TO FIGHT THE LAPTENS?

How then can one explain the relatively small losses of Li8 7 on the Soviet-German front even in 1943-1944? They look especially amazing if you stick to the traditional Soviet idea of the "obsolete" AND "low performance" of this aircraft. However, we must not forget that by the 43rd "lappetzhnik" had undergone a significant modernization, which seriously improved, in particular, its speed characteristics. The production of La8 7V aircraft - by whose maximum speed of 340 km / h we are usually judged by all "eighty-sevenths" - was discontinued in the fall of 1941. Since 1942, in the Soviet-German

At the front, the L1870 was already used, on which instead of the L1p1o211A engine there was a L1p1o2 117, the takeoff power of which was 1410 hp. against the previous 1010 hp. This (as well as improving the aerodynamics of the car) brought the maximum speed of the "Stuka" to 410 km / h (note that for the serial IL-2 of 1943-1944, it did not exceed 405 km / h)? 5. Of the 4881 Stukas produced by the Germans, 3564 (i.e. 73%) belonged to modifications of the O? 6 family; Thus, the absolute majority of the L187 aircraft used during the war years on the Soviet-German front was not inferior in maximum speed to the two-seater IL-2 (which, note, no one criticizes for "low flight data").

Of course, the L18 70 could not get away from the fighters either (as, indeed, all Soviet bombers and attack aircraft

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period 1942-1945). However, by 1943, the defensive capabilities of the Stuka had also increased. Already on the R-1 modification, instead of one MC 15 machine gun, the shooter received a pair of much faster-firing MC 81 (it was designated as MO817,). Although the caliber of the machine guns remained the same, rifle (7.92 mm), the Stuka's defense capability at short distances improved significantly (and at long distances, the fire of Soviet fighters was ineffective). On the O-5 modification (almost a quarter of all produced L187s - 1178 vehicles? 7) were equipped with two 20-mm MS 151/20 20-mm cannons instead of two wing-mounted 7.92-mm MC17 machine guns - so the "lappetzhnik" was now in front protected almost as well as the IL-2 with 23-mm VYa guns, and better than the IL-2 with 20-mm ShVAK guns (which were inferior to the German gun in terms of projectile weight). In addition, the cabin and individual units of the propeller group were armored on the L187O.

Finally, we take into account that the all-metal construction of the Stuka had excellent survivability. This was especially emphasized, in particular, by the famous H. W. Rudel?8 - a pilot who made more sorties on the L187 than anyone else. According to his memoirs, after one of the battles with the "Aircobras" of the 5th Air Army of the 2nd Ukrainian Front in the Balta region in March 1944, when viewed at the airfield, it turned out that Rudel's L187S withstood hits not only from multiple 12.7- mm bullets, but also eight 37-mm shells! This looks incredible, but a similar fact is also reported in Rudel's report on the battle he conducted against the fighters of the 5th Air Force on May 31, 1944 in the Iasi region. After landing, it is indicated there, "the entire "junkers" looked like a sieve made by 20- and 37-mm projectiles" 2x9.

But, as we have seen, the IL-2 attack aircraft did not save from heavy losses either even more powerful than the "Shtuka" weapons, nor much more powerful armor. And Romanian 187 died in the same operation (in

recalculated for one sortie) an order of magnitude more than the German ones. Therefore, in the first place among the reasons

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relatively small losses of the L187 on the Soviet-German front, one should put the "human factor" - and above all the high flying and tactical skills of the German "stuff pilots". A huge role here, in particular, was played by the colossal combat experience accumulated by a significant part of them. So, from the information that M.V. Zefirov cites in the list of German attack pilots - Knights of the Royal Cross - it is clear that at least (51!) 75 pilots completed more than 400 sorties on the L187 (including 15 - more than 400, 18 - more than 500, 13 - more than 600, 12 - more than 700, 10 - more than 800, 3 - more than 900, 2 - more than 1000, M. Otte from the 2nd dive (then - 2nd assault) squadron - 1179, and H.U. Rudel, who fought in the same formation, about 2500)³⁹. For comparison: of the much more numerous Il-2 pilots, only 9 to 11 people crossed the bar of 400 sorties (including 3 to 8 performed more than 400, from 2 to 5 - more than 500 and 1 - more than 700)³¹! . Great combat experience allowed the pilots of the L187 "to accurately determine when Soviet fighters approached the effective fire distance, and to perform an evasive maneuver in a timely manner"²?. "We are being attacked by more than 20 La-5s," recalled H.U. When another Russian fighter enters my tail from behind, I wait, and then at the last moment abruptly go down or to the side. The same situation is described by I.N. Kozhedub, talking about the battle of the La-5 of the 240th Fighter Aviation Regiment of the 302nd Fighter Aviation Division of the 2nd Air Army of the Voronezh Front with a group of "laptezhniks" over the southern face of the Kursk Bulge on July 6, 1943. : "I'm trying to attack the Junkers, go to his tail. He maneuvers. Gets out of sight. [...]"

Under enemy fire, I again lead the plane into the attack. Zaho ZhU "Junkers" in the tail. I'm getting closer. I'm aiming. I think the distance is right for him. I press the triggers. The guns worked. And the Junkers does not fall. I shoot again. The German bomber began to maneuver.

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I forget about everything that is going on around. All I see is Young Kers and I keep shooting. [...]"

I am close to the enemy. The Junkers is still manoeuvring.

In the end, junior lieutenant Kozhe oak, according to him, shot down this "Thing" - but used up almost the entire ammunition load in several unsuccessful attacks ...

Soviet fighters could not respond in a timely manner to sudden sharp turns of the "lappet" (the turning radius of a high-speed machine is always greater than that of a slow-moving one) and slipped forward, losing sight of the enemy. (The same picture was repeated as in the battles of the Bf 109 with the Il-2.)

Note that in order to perform a steep turn, at which very large g-forces were created, the pilot also required special training - provided only by significant flight practice. In June 1944 Major H.W. The maneuverability of this machine was much worse than that of a conventional Stuka: two 37-mm cannons suspended under the wing caused a large spread of masses along the wing span. Now Rudel had already 2000 sorties behind him!

The high qualifications of the L187 pilots also made it easier for them to maintain their place in the ranks of the group. But, as the same Rudel noted in a report on the actions of the "Shtuka" near Iasi in May - June 1944, "losses remained sky-high only if the order was maintained"; "dive-bombers that broke away from the formation were immediately shot down"?. In fact, while the L187s were flying in close formation, their gunners (like the gunners of the Soviet Il-2) could organize fire interaction and mutually cover each other, concentrating the fire of several aircraft on the most dangerous of the fighters attacking the group at the moment. In addition, an aircraft flying in close formation could only be attacked from a limited number of directions: from others, it was covered by neighboring aircraft. In chapter III, we already noted what huge losses the IL-2 suffered due to the inability to

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poorly trained Soviet pilots to maintain formation while moving away from the target; the same thing happened with L187 of the Romanian Air Force ... 36

In general, the rationality of defensive tactics, not only of single aircraft, but also of groups, helped the Stukas avoid heavy losses in battles with fighters. So, they often used a "defensive circle", where the tail of each L187 was covered not only by the fire of its own shooter, but also by the fire of wing machine guns or cannons of the aircraft flying behind. Sometimes (for example, in the battles in the Right Bank Ukraine at the beginning of 1944), this "circle" pressed against the ground itself, so that it was practically impossible to attack the "Stukas" from below, and from above it was dangerous: a fighter accelerated on a dive could, leaving attacks, crash into the ground ... Near Iasi in May - June 1944, the L187 leaving after dropping bombs lined up in a "snake of links": each link flew above or below the one in front and behind, and in the link itself the planes became each other's tail. This "snake-like compact mass" could (unlike the "circle") fly freely in the direction it needed.

research institutes; the density of the formation did not allow the fighters to go into the tail of any of the "lappeters", except for the end, and the separation of neighboring links in height made it possible to protect at least half of the aircraft from attacks from below, against which the L187 were defenseless. They also approached the target L187 near Iasi with a "snake of links" (only each link went in the "wedge" formation), and sometimes in the formation of the bearing of the links or the front. In the last two cases, fighters attacking from behind found themselves under crossfire from several tail gunners at once. And near Narva in February 1944, units of the "Stuk" went to the target, lining up in a rhombus. As a result, V.F. Golubev, then commander of the 4th Guards Fighter Aviation Regiment of the 1st Guards Fighter Aviation Division of the Air Force of the Baltic Fleet, noted that "their firepower was so strong that it was very difficult to overcome it with single or scattered attacks"³⁸.

The magnitude of combat losses L187 affected, of course

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but, and insufficient training of the majority of Soviet fighter pilots. According to a number of former Stuka pilots, in 1941 "Soviet fighters did not pose a serious threat to them" precisely because of their inept and not distinguished by persistence actions. "Having carried out a bombing strike, dive squadrons invariably managed to shake off Soviet aircraft after five minutes of maneuvering in a defensive circle and go home at low altitude." Things were about the same throughout almost the entire 1942 of the year ... 39 Having tested at the end of the 42nd near Stalingrad and successfully applied in the 43rd in the Battle of Kursk a technique very dangerous for L187 - an attack from below with shooting at an unprotected "belly" of the "lappet" - for some reason, the Soviet pilots almost did not resort to it in the future (even if the "Junkers" were at a sufficient height for this). Instead, they preferred to fight their way through cannon and machine gun fire—or refuse to attack at all. According to H. W. Rudel, most Soviet fighter pilots lacked aggressiveness as early as 1944; "only a few elite units were an exception to this rule" ⁴⁰.

As a result, according to the testimony of the same Rudel, his III group of the 2nd assault (until October 18, 1943 dive) squadron - fought in the 41st and in Belarus, and near Smolensk, and near Leningrad, which passed through Moscow and Sta the battle of Leningrad, the air battles in the Kuban, the battle of Kursk, the battle for the Dnieper, which repelled the "second Stalinist strike" on the Right Bank Ukraine in early 1944, by the summer of 1944 "had practically no" losses from Soviet fighters. Approximately the same, apparently, was the case in other units flying the L187. So, the 3rd group of the 1st assault (former dive) squadron back in January-March 1944, fighting in the Vitebsk region, suffered all its losses from anti-aircraft fire⁴²; numerous

fighters of the 1st and 3rd air armies of the Western and 1st Baltic fronts did not manage to shoot down a single "Thing" then ...

- As for anti-aircraft artillery - the main enemy

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L187 on the Soviet-German front, then it should be taken into account that to hit a diving, i.e. Continuously and quickly changing the flight altitude, the aircraft is very, very difficult for anti-aircraft gunners. And, "according to the crews of the Luftwaffe," the Soviet anti-aircraft gunners "were completely incapable of combating diving aircraft"\3.

But, perhaps, the strong opposition of anti-aircraft artillery and fighters at least disrupted the performance of combat missions by the Stukas? The memoirs of Soviet fighter pilots are literally replete with episodes in which "lappeters" who have sensed danger randomly drop bombs anywhere and refuse to try to break through to the target ... Of course, it happened like that. Here is just one example: as M.E. Morozov showed, it is the actions of anti-aircraft gunners of the Baltic Fleet and the Leningrad Air Defense Army that can be considered the reason for the low effectiveness of strikes by the L187 Sh group of the 1st dive squadron and [Gi P group - 2nd dive squadron against the ships of the Baltic Fleet on the Neva River in April 1942. Fearing to enter the zone of powerful anti-aircraft fire, the dive-bombers then bombed from too high altitudes, without aiming"4 (however, another explanation is possible: the command of the 1st air fleet of the Luftwaffe, which was acutely short of aircraft to support ground forces in fierce battles near Pogostya, in the Luban "cauldron" and near Staraya Russa, and which undertook strikes on ships only at the insistence of Goering, recommended that the crews not take risks in these, in his opinion, sorties.

There are, however, many examples to the contrary. So, 349 anti-aircraft and universal guns of the Kronstadt naval base and the ships stationed in it could not prevent L187 from the 2nd dive squadron from sinking on September 21-23, 1941 the battleship "Marat", leader "Minsk", es minets "Stereushchy", submarine M-74, minesweeper No. 31, hydrographic vessel, transports "Maria", "Barta", "Levanovsky", tug KP-36, floating crane and several barges and damage the battleship "October Revolution" , the cruiser "Kirov", the destroyers "Grozyashchiy", "Sil

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ny" and "Glorious", the gunboat "Pioneer" and several auxiliary vessels
"6. "The defense was simply deadly," H.W. Rudel, a participant in these raids, later emphasized, "I didn't see

nothing like this"" . "Dozens, hundreds of blue-blue explosions dotted the sky," confirms a Soviet eyewitness to the raid on September 23, the then commander of the Baltic Fleet, V.F. Tributs⁴⁸. In general, a strong anti-aircraft artillery cover did not at all guarantee the safety of the Soviet side from La87 strikes. Affected by the frequent insufficient training of anti-aircraft gunners and the VNOS service. "As always (almost always) in this case, ground-based air defense, with a delay until the enemy almost retreated from the target, launched a terrible fire on the target," wrote in his diary after the raid of three L187 on the Tashlyk airfield (west of Kirovograd) in March 1944, the head of communications 4th Fighter Air Corps F.M. Smolnikov, - but the enemy, apparently, had long studied the air defense, based 100 km from the front line, and therefore slowly, methodically shooting back, went to the south / west "4?. The history of the confrontation between the Luftwaffe and the 1st Tank Corps of the 11th Guards Army of the Western Front during the Oryol operation in July 1943 is also indicative. "still, it was insignificant due to the mass nature of anti-aircraft fire, which disrupted the enemy's ability to bomb accurately." Then, on July 16, the "laptezhniks" fell on the anti-aircraft artillery regiment attached to the corps - and in the evening they left only four guns from it. After that, on July 17 and 18, L187 and H\$129 attack aircraft bombed and shot down Soviet tanks with cannons already "with impunity" ... 50 True, in both examples we cited, the Shtuk targets were too weakly covered by fighter aircraft. But by the first day of Operation Citadel, the Voronezh Front had, as already noted, not only powerful anti-aircraft weapons, but also a mass of fighters. Nevertheless, the battle formations of his troops were nevertheless subjected to massive attacks by the 2nd and 77th

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dive squadrons. We will only cite the testimony of N.K. Popel, who personally observed on the morning of July 5, 1943, how the "lappeteers" were processing the positions of units of the 6th Guards Army and the 538th and 1008th anti-tank artillery regiments of the 1st Tank Army (a member of the Military Council of which Popel was then). "The regiment has been fighting for less than an hour, and a third of the guns have already been put out of action. Thin out your calculations. Losses are not so much from tanks, but from aircraft.

The sky is in the undivided power of the German dive bombers. They either fly one after another in a closed circle, or stretch out in a string. Then they spin in a round dance again, dropping bombs in turn. Dozens of such round dances are circling in the sky. And from below, columns of smoke and flame rise up to them, pieces of gun carriages fly, a beam on ... ">!. According to both German and Soviet documents, it was the strikes of the Laptezhniks that on that day broke the resistance of the 52nd Guards Rifle Division - one of the three, in the sectors of which the Germans broke through the first line of defense of the troops of the Voronezh Front ??.

And here is what happened in the Voronezh Front on July 10, 1943 - when his 2nd Air Army had already been reinforced by an entire division of fighters. "We followed with admiration the actions of the dive bombers, which continuously attacked Russian tanks," this day was recorded in the combat log of the reconnaissance detachment of the Grossdeutschland motorized infantry division, which gnawed through the defenses of the 1st Panzer Army in the Oboyan direction. "One after another, squadrons of dive bombers appeared and dropped their deadly cargo on Russian vehicles. A blinding flash showed that another enemy tank was "ready". It happened again and again" ³. On the same day, the "Stukas" of the 2nd and 77th squadrons ensured the success of the SS motorized infantry division "Leibstandarte SS Adolf Hitler" in the Prokhorovka direction ... On July 12, they stopped the offensive of the 29th Tank Corps of the 5th Guards Tank Army, pushing the "Leibstandarte" near Prokhorovka ... 54

Broke through to their goals and L187, acting on se

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the correct face of the Kursk Bulge, against the troops of the Central Front. "In the early days of the offensive near Kursk," recalled F. Lang, then commander of the 3rd group of the 1st dive squadron, "we carried out an average of 5-6 sorties daily, attacking various targets [...]. Often we had to engage in combat with Soviet fighters. There were 386 combat-ready "hawks" in the 16th Air Army of the Central Front (despite the fact that the enemy had only 186 fighters in this direction); there were more anti-aircraft weapons per kilometer of the section of the German breakthrough than that of the Voronezh Front (the Central Front alone had 1 [131] 56 anti-aircraft guns by July 1. And yet, later reported the senior officer of the General Staff at the Central Front, Colonel V.T. .]. As can be seen from the reports of the front commander K.K. Rokossovsky to I.V. Stalin, the same picture was on July 6-9⁷⁷. It was the massed strike of the Stuk that forced the 132nd Rifle Division of the 70th Army to withdraw on July 5, and on July 7, L187 and L188 forced the 17th Guards Rifle Corps of the 13th Army to retreat 2-4 km ...

Here, the mediocre use of numerous Soviet fighters, which we described in chapter P. "A surveillance, warning service along the Air Force line was not organized"³⁸, and the headquarters of formations on the ground forces had no direct connection either with the headquarters of with the command post of the headquarters of the 2nd Air Army - and fighters could only be called through the headquarters of the front! While the request and the response order passed through all intermediate instances, the "lappeters"

they already had time to fly away ... The same thing happened in the Mius operation of the Southern Front that began on July 17, 1943. Here, for example, are the memoirs of the former regimental artilleryman from the 87th Guards Rifle Division of the 2nd Guards Army, I.G. Kobylansky. "One approach, another, a third, and nine dive-bombers line up on the way back. And in this

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time is already approaching us, the second nine "Junkers" repeat the same maneuvers and three times bombing, followed by the third without a break, and this hell has no end. The anti-aircraft guns do not have us, the aircraft is not visible, and the fire from small arms is for the "musicians" [so the Soviet front-line soldiers called the L187 because of the sirens that turn on when they dive. - A.S.] is not terrible "Eh?.

As you can see, contrary to our popular belief, the L187 aircraft could successfully carry out their tasks even in the middle of 1943, when the Soviet Air Force already had a huge number of modern fighters.

And not only in the 43rd. As early as May 5, 1944, as many as five La-5 squadrons from the 3rd and 4th Guards Fighter Aviation Regiments [1st Guards Fighter Aviation Division of the Air Force of the Baltic Fleet (i.e., about 50 fighters!)] Could not stop a large group L187, breaking through (under cover, however, E\190) to Soviet ships in Narva Bay. "Did not stop him [the enemy. - A.S.] and massive anti-aircraft fire from the shore and ships, "the former commander of the 4th Guards V.F. Golubev later admitted. True, he adds, only "small groups" of "bast shoes" managed to break through to the target and drop bombs - but they also inflicted serious damage: they sank two minesweepers and damaged a gunboat. According to the According to H.W. Rudel, enemy fighters only once during the entire war forced him to drop bombs before reaching the target - in July 1944, in the Yaroslav region in Galicia. And then it was the Mustangs of the US Air Force ... Both before and after, the famous "pilot" emphasized, "we always struck at the intended target, even in the event of an overwhelming superiority of enemy aircraft"¹.

True, V. Schwabedissen also points to a decrease in the effectiveness of the Stuk bombing strikes in 1944-1945, due to the strong opposition of Soviet fighters. In order to bypass the barriers of the latter, L187 were forced to go to the target at a very high altitude and, accordingly, dive from it - and this worsened the aiming conditions.

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3. HOW EFFECTIVE
WAS ACTION 4187?

The actions of the Stukas of the 2nd and 77th squadrons during Operation Citadel, discussed above, shed light on the next question - about the degree of effectiveness of the combat work of the L187 on the Soviet-German front. As you can see, back in the middle of 1943, the "lappets" were an effective tactical weapon capable of deciding the outcome of the battle of ground troops ...

Even more such examples are provided by the campaigns of 1941 and 1942. For example, on the North-Western Front on June 22, 1941, the 5th Panzer Division of the 3rd Mechanized Corps, ⁶³ defending the strategically important bridges across the Neman in Alytus, "lost its combat capability" from massive Shtuk strikes; in August, the "laptezhniki" made it possible to repel a counterattack by the 34th Army near Staraya Russa. On the Western Front, on June 25, 1941, L187 scattered the 6th Cavalry Division of the 6th Cavalry Corps, which had concentrated in the initial area for the offensive (near Makovlyana, southwest of Grodno), thereby excluding its participation in the counterattack of the cavalry-mechanized I.V. Boldin's group on Grodno (on June 26, the 13th Infantry Division of the 10th Army, which was retreating from the Narew River to Supraselskaya Pushcha, was scattered in the same way). To a large extent, due to the strikes of L187, the entire counterattack, delivered on June 24-25 south of Grodno by the Voldina group, was choked, as well as three more counterattacks by the troops of the Western Front: the 29th Panzer Division of the 11th Mechanized Corps of the 3rd Army west of Grodno on June 22, the 30th Panzer Division of the 14th Mechanized Corps of the 4th Army near Pruzhany on June 23 and the 5th and 7th Mechanized Corps of the 20th Army near Senno and Lepel on July 6-9, 1941 ("The biggest loss of aviation," the head of the combat training department [A.V. Borzikovb of the Main Armored Directorate of the Red Army, A.V. th dive squadron played decide

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And

a key role in the rapid rollback of the 28th Rifle Corps of the 4th Army in the Kobrin-Brest direction on June 23-24, 1941. army headquarters. During the Rzhev-Sychevsk operation in August 1942, L187 more than once thwarted the attacks of the troops of the 30th Army of the Kalinin Front north of Rzhev even before they began, when the attackers were just accumulating in their original positions. As A.I. Shchukin, who was then the head of the reporting point in the 140th Infantry Division, noted, the work of the "lapemen" "if not completely, then significantly paralyzed the actions of our troops" ... 66

And at the beginning of the battle for Moscow, in October 1941, L187 turned out to be a factor not of tactical, but of operational significance. By continuously bombing the troops of the 43rd Army of the Reserve Front encircled near Vyazma, the Stukas of the 2nd dive squadron essentially deprived them of their chances of breaking out of the "cauldron". "Divisions do not exist as combat units," the army headquarters informed, for example, in those days, "but there are small, demoralized by enemy aircraft, groups of infantry fighters, special forces and artillery ... Divisions suffered very heavy losses, aviation is especially rampant. It makes systematic raids in groups of 20-25 aircraft. [...] In general, our army is not capable of waging any kind of battle, since all the remaining ones have become somehow crazy»67.

Exactly the same contribution was made by L187 to the catastrophic outcome of the Kharkov battle of 1942 for the Soviet troops. "Especially convincing," noted in the report of the High Command of the South-Western Direction to I.V. Stalin on the results of the battle, "were the actions of the enemy aviation against our troops, who found themselves [May 22, 1942 - A.S.] surrounded. Continuous air attacks by the enemy made it extremely difficult to regroup troops for an attack to the east, violated command and control and, upsetting battle formations, disrupted the actions of troops to withdraw from the encirclement"68.

The following month, the continuous strikes of Li87 helped the enemy eliminate another "cauldron" - between Lyuban and Novgorod, where the 2nd shock army of the Volkhov Group of Forces of the Leningrad Front (transformed on June 8, 1942 into the Volkhov Front) was surrounded. "The enemy," reported the commander of the Leningrad Front, M.S. Khozin, on June 5, "is using a mass of bomber aircraft against our combat formations, which essentially paralyzes the actions of our advancing troops" - both the 2nd strike and the 2nd shock, and making its way towards it 59th Army?. "Lieutenant General Vlasov especially emphasizes the destructive action of German aviation," says the protocol of interrogation of the captured army commander of the 2nd shock squad dated July 15, 194270. Of course, prisoners (as we have already noted in chapter []) are inclined to flatter those in whose power they are, but between June 16 and 20, A.A. Vlasov denounced the "big losses from enemy aircraft" to the Military Council of the Volkhov Front (and on the 15th that "the troops" of the 2nd shock "carry huge losses from enemy aviation and fire", the chief of staff of the front, G.D. Stelmakh, also reported upstairs)71. According to the report of an employee of the Special Department of the NKVD of the Volkhov Front, Kolesnikov (who personally observed the agony of the 2nd shock), it was the German dive bombers who prevented the breakthrough of the main forces of the army from the encirclement. The encirclement exit through the corridor near the village of Myasnoy Bor, which began on the night of June 25, 1942, was already stopped in the morning "due to almost continuous enemy air raids"...72

Even in the summer of 1943, which we consider to be the year of decline, could influence the course of operations.

Glory to La87... So, in the Oryol operation, their strikes against the mobile groupings of the Western, Bryansk and Central fronts advancing in the Oryol ledge did not allow them to achieve the main goal of the operation - the encirclement of the Oryol group of Germans. First, on July 14-17, 1943, L187 (with the support of 188) stopped the 1st Guards Tank Corps of the Bryansk Front - whose blow was supposed to cut the Oryol group. "Aviation," reported

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subsequently the commander of this formation, M.F. Panov, was the main means of influencing the enemy on advancing formations and parts of the corps. Quite often, losses from enemy aircraft exceeded losses on the battlefield. Then, on July 16-17, the Stuka was forced to stop and take cover in the forests and the mobile grouping of the Western Front - the 1st and 25th tank corps of the 11th Guards Army. But they have already escaped into the operational space And intelligence units have already reached the Khotynets station on the Orel-Bryansk railway, i.e. threatened to cut the communications of the 2nd Panzer Army! The delay of this half of the Soviet "pincers" allowed the Germans to transfer reinforcements to the area north of Khotynets. And after the strikes inflicted by the air formation under Colonel E. Kupfer on the 1st and 25th corps on July 19-2, the commander of the 2nd Panzer and 9th armies defending in the Oryol ledge, V. Model, is certainly a patriot of his land troops - considered that "for the first time in the history of wars, an advancing tank grouping was destroyed only by aviation forces, without any support from ground troops" 4. The 2nd and 3rd dive squadrons ... Finally, on August 1-3, La87 and twin-engine bombers also detained the second, southern half of the "pincers" that were planned to close in the rear of the Oryol group - the 9th tank corps of the Central Front. This allowed the German troops to break away from the persecution of Soviet tankers and catch on abroad along the Kroma River. And on August 5, even though the Soviet fighters forced some of the "laptezhniks" to prematurely drop their bombs, the L187, together with the twin-engine bombers, made it extremely difficult for the Soviet tankers to force the Kroma. Among other things, they put out of action the entire headquarters of the chief of artillery of the 9th Tank Corps, and the 106th Tank Brigade of the 6th Guards Tank Corps of the 3rd Guards Tank Army was forced to return to the southern coast ... First of all, La87 one should also refer the assessment of the representative of the Headquarters of the Supreme High Command to the West

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nom and Bryansk fronts of N.N. Voronov, made by him on July 26, 1943:

Enemy aircraft has a great moral impact on our troops, very often it slows down the pace of our advance”²⁵.

Following Orlovskaya, the Smolensk operation, which began on August 7, 1943, dragged on due to opposition from L187. The "Laptezhniki" again inflicted heavy losses on the mobile grouping of Soviet troops - the 5th mechanized corps of the Western Front - and it was still unable to turn the tactical breakthrough made between Kirov and Spas-Demensk into an operational one ...

First of all, the high effectiveness of their bombing strikes made the L187 a formidable tactical weapon. We emphasize that it can be estimated only on the basis of information from ground based observers. Aircraft crew reports—as we have already noted in Chapter III—cannot differ in accuracy by definition. Not to mention the natural desire to exaggerate their success, the aviators are simply unable to notice and count from the air all the soldiers, cannons, etc. they have destroyed; the onboard photo or movie camera is not able to fix everything either (especially since it was almost impossible to catch the attacked targets in the camera lens during a steep dive) ... As for ground observers, we do not know whether the German figures cited in the literature are confirmed tanks, pillboxes, etc. destroyed by "Stukas" ground inspectors of the Wehrmacht. Yes, and such a check could take place only if the area in which L187 worked, then passed under the control of the German troops - the attack did not always happen; since the summer of 1943 - extremely rare in general ... Therefore, to evaluate the effectiveness of L187 strikes, we will use almost exclusively

especially Soviet sources.

These sources paint a very impressive picture. Here are just the results of the work of "Stuk" in the first six days of the war in the strip of the Soviet Western Front - envy

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for the most part by those who were then subjected to their blows (and whose memories were collected by D.N. Egorov), as well as by reports and reports of commanders and headquarters of Soviet units and formations.

On June 22, 1941, L187 completely (and in just 15 minutes!) destroyed the 171st light artillery regiment of the 49th rifle division of the 4th army on the march, disabled all materiel of the 75th howitzer artillery regiment of the 27th rifle division 3 1st Army, inflicted "tangible losses" on the 164th Light Artillery Regiment of the 2nd Infantry Division and the 7th Howitzer Artillery Regiment of the 7th Tank Division of the 6th Mechanized Corps of the 10th Army - and completely defeated the artillery defending on the Augustow Canal 56th Infantry Division of the 3rd Army. Already the first bombing strike disabled more than half of the guns, many tractors and

tires and destroyed many fighters and commanders of its 247th howitzer artillery regiment, and the second one completely finished off this unit (out of 1240 personnel, only 78 soon left for the Neman). A significant contribution was made by "Stukas" and the destruction of the 113th light artillery regiment of the 56th division (in which by 18.00 only two guns remained). They inflicted heavy damage on that day to the 85th rifle division of the 3rd army southwest [natively ("very serious losses in people, materiel and horses" suffered, in particular, one of the divisions of its 223rd howitzer artillery regiment) and the 30th Panzer Division of the 14th Mechanized Corps of the 4th Army northeast of Brest. Bombing the combat formations of the 57th Tank Regiment of the 29th Tank Division [1st Mechanized Corps of the 3rd Army west of Grodno, L187 achieved several direct hits on their T-34s and T-26s; since the armor of these vehicles was also pierced by fragments of 250-kg air bombs, one should pay attention to the "soldier rumor", which "on the second or third day of fighting" near Grodno "told that many Soviet tanks were burned by air strikes" 76 .

On June 23, south-east of Grodno, the Laptezhniks destroyed the 1st division of the 444th corps artillery regiment of the 4th rifle corps of the 3rd army and the rear of the 85th rifle division

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(3rd automobile battalion and 87th field auto-bakery of waters). Attacking the 7th Panzer Division of the 6th Mechanized Corps of the 10th Army east of Bialystok, they (as is clear from the report of Divisional Commander-7 S.V. Borzilov), disabled 17% of its tanks - 63 vehicles out of 368 available June 22 - and completely defeated the rear of both tank regiments of the division. The 18th Panzer Division of the Wehrmacht, which counterattacked near Pruzhany, the 30th Panzer Division of the 14th Mechanized Corps of the 4th Army from L187 suffered (according to the former Chief of Staff of the Army L.M. Sandalov) "losses no less than from tanks and artillery." Before the battle, the 30th had 120-130 serviceable T-26s, and in the battle, according to the morning report of the Military Council of the 4th Army of June 23, it lost 60 tanks; consequently, the "laptezhniks" destroyed 20-30 T-26s - or from 16 to 25% of the division's combat-ready tanks ... And near Name-day (north of Kobrin) they burned about 27-30 out of 67 tanks that had survived by that time 22- th tank division of the same corps.

On June 24, L187 (together with H \$ 123 attack aircraft and, possibly, VP 09 fighters) again inflicted heavy damage on people and equipment of the 85th Infantry Division near Grodno. And the 4th Panzer Division of the 6th Mechanized Corps, which was advancing on the Indura (south of Grodno), lost, according to the report of Divisional Commander-4 A.G. Potaturchev, up to 20-26% of its tanks.

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On June 25, in the area of Makovlyan (southwest of Grodno), the "laptezhniks" destroyed all artillery and a huge number of

a large number of people and horses of the 94th cavalry regiment of the 6th cavalry division of the 6th cavalry corps of the cavalry mechanized group of I.V.

On June 26, in the area of Bolshaya Berestovitsa (north of Volkovysk), "Stukas" dispersed the 144th cavalry regiment of the 36th cavalry division, and north of Bialystok inflicted significant damage on the 200th rifle regiment of the 2nd rifle division of the 10th, which was retreating from Osovets to Suprasl army.

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On June 27, after the L187 raid, in two batteries of the 128th separate anti-tank battalion of the 86th rifle division of the 10th army, which were defending on the Narew River in the Bialystok region, only 3 guns remained, and in the Volkovysk region, the "laptezhniks" destroyed almost all the materiel that remained back in the 35th Tank Regiment of the 6th Cavalry Division.

On the Northwestern Front, the Stukas accounted for a "significant percentage" of the approximately 90 BT-7s, T-28s and T-34s that were lost on June 22 by the 5th Panzer Division in the battle for Alytus; on the Southern Front, on July 8, La87s from the 77th dive squadron inflicted "significant losses" on the 2nd mechanized corps advancing in Northern Bessarabia (north of the city of Balti)⁷⁹. |

And here are the results of L187 attacks on tank units and formations at the end of 1941-1943. On July 8, 1943, during the defensive battle of the Voronezh Front on the southern face of the Kursk Bulge, near the village of Storozhevoye: "laptezhniks" in one raid disabled a quarter of the tanks of the 15th Guards Heavy Tank Regiment of the breakthrough of the 2nd Tank Corps - two out of [11 English MK-4 (Churchill) vehicles) were hit, and two burned down from direct bomb hits. On July 12, L187 burned and knocked out 20% of the tanks that still remained in the 5th Guards Tank Corps (4T-34 and 2 Churchills; dive bombers on that day accounted for 37.5% of the total losses of the corps in tanks)⁸⁰. According to the report of the commander of the operational group of the Western Front, I.V. Boldin, on October 4, 1941, up to 30% of the materiel of his troops⁸ was destroyed in the area of Kholm-Zhirkovskiy L187! — i.e. including the 126th and 128th tank brigades. Taking into account that according to the state in the tank brigade then there should have been 46 tanks? and that the brigades were unlikely to be 100% complete, it can be assumed that Boldin's group lost up to 25 tanks. According to German data, the Stukas flew to the Kholm-Zhirkovsky area 152 times that day⁸³; thus, for one destroyed tank, there were no more than 6 sorties (actually, apparently, less, since dive bombers probably bombed not only tank units). The latest conclusion is consistent with information about the L187 flights to the 9th Guards Cossack Cavalry Division

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the vision of the 4th Guards Cossack Cavalry Corps of the 1st Belorussian Front in the Pruzhany area on July 12, 1944, reported by the former commander of the 181st Guards artillery and mortar regiment of this division, B.I. Strelchenko. During the first raid, 7 or 8 "laptezhniks" - despite, by the way, barrage fire from a battery of 37-mm anti-aircraft guns - destroyed three "Valen secrets" tanks of the 151st Guards Tank Regiment with bombs, "i.e. 2-3 sorties were spent on one tank ... However, in mid-March 1943, west of Belgorod, one La87 raid in the 3rd Guards Tank Corps of the Voronezh Front killed 26 tanks at once⁸⁵. Since in the Battle of Kharkov in 1943 the "laptezhniks" operated in groups of 10-15 and 50 vehicles⁸⁶, it can be concluded that it took them only 0.5 to 2 sorties to destroy one tank. The strike of a group of 18 L187 and 18 L188 on the 1st Guards Tank Corps of the Bryansk Front near the village of Grachevka (near Novosil) on July 13, 1943 turned out to be just as effective - from which the corps lost 23 tanks and 45 vehicles burnt and damaged ". Even if we assume that the crews of the twin-engine "Junkers" acted with the same efficiency as the "stuff pilots" trained in attacks of small targets, then it turns out that only about 1 sortie La87...

Let's compare these results with those achieved by the Il-2 attack aircraft. As we have seen, since the summer of 1943^g, "humped" began to use against tanks not only high-explosive (like L187Vi r), but also much more effective cumulative bombs. But even then - as combat experience showed - for the guaranteed destruction of one tank on the battlefield, it was necessary to spend from 18 to 30 Il-2 sorties. And in order to hit one tank with 37-mm NS-37 cannons - as field tests and, again, battle experience revealed - it was necessary to send at least 15 attack aircraft⁸⁸. As you can see, the 41st, 43rd, and 44th L187s were many times more effective against tanks ... And this was using bombs - and two 37-mm guns,

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installed on the L187S, which had been used since the summer of 1943 (whose combat work will be described below), were, according to German pilots, even more effective anti-tank weapons.

The effectiveness of the L187 bombing strikes can also be judged by the fact that in the second of the raids described by B.I. 20% of the horses of the 32nd Guards Cossack Cavalry Regiment, almost its entire regimental battery

(i.e., apparently, three guns out of four) and two out of four guns of the 181st Guards Artillery Mortar Regiment given to him⁸⁹. Let's take the risk of recognizing this damage as significant, and the actions of the seven "lappeters" as highly effective ... According to the report of the headquarters of the Voronezh Front on the defensive operation on the Kursk Bulge, on the first day of this battle, July 54, 1943, the loss of troops in the manpower of aviation (due to the presence of a "widely developed system of trenches and shelters") were "insignificant". However, in the combat log of the 52nd Guards Rifle Division of the 6th Guards Army, it appears that L187 strikes in it that day "many artillery equipment, weapons and manpower" were put out of action ... 90

And here are the results of L187 strikes from the [group of the 5th dive squadron in Murmansk. During the raid on April 3, 1942 on the port of Murmansk, only 8 "Pieces" managed to effectively hit seven targets: they sank the English transports Ty 3-58 "New Westminster City" and 5-67 "Tobruk", the Soviet trawler RT-61 "Vodnik", damaged the \$-52 transport "Empire Starlight", the Soviet hydrographic vessel "Ost" and the trawler RT-7 "Syomga" and destroyed the fish factory. On April 15, having dropped 19 high-explosive bombs on the port and the raid, La87 sank transport 5-59 Lancaster Castle, again damaged the Empire Starlight, destroyed berth No. 10, a warehouse, a railway crane and three railway tracks. On April 23, 10 Laptezhniks destroyed four targets in the port: they sank a 45-ton floating crane, the Stroitel tugboat, and destroyed berth No. 9 and a warehouse. | June 14 "Pieces" managed to reliably hit only two objects (sank with

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Soviet steamship Subbotnik and finished off the Empire Star Light), but on June 5, pinpoint strikes completely destroyed the main food reserves of Murmansk hidden in the rocks and not only destroyed the head station of the city water supply system, but also hit the "thread" of the water pipeline in six places (On June 10 they killed her already in 18 places, and on the 12th - in 30-91. And on February 28, 1943, a pair of L187s destroyed the building of the NKVD Directorate in Murmansk with a precision strike ...

The effectiveness of L187 bombing attacks on sea targets becomes especially impressive when compared with that of the Soviet Pe-2 dive bombers (comparison of L187 with Il-2 will not be correct here: after all, ships and ships are classic point targets, bombing of which was better in those years everything was carried out from a steep dive). Sources allow a fairly complete comparison of the results of the L187 and Pe-2 strikes on ships of the destroyer class (in the Soviet fleet of those years it was called "destroyers" and included two subclasses: "destroyers" and "destroyers-leaders").

To sink on September 21, 1941 on the Peterhof roadstead the destroyer "Guarding", the "Stuks" of the 2nd dive squadron needed (according to Soviet reports -

pits) a total of 12-16 sorties and one raid⁹². To destroy on October 6, 1943 in the Black Sea, a detachment consisting of the leader "Kharkov" and the destroyers "Able" and "Merciless" "Junkers" of the Shgroup of the 3rd dive squadron spent about 50 sorties during four raids, T .e. 16-17 per ship. (If we take into account that "Kharkov" and "Merciless" sank already as a result of the third raid, it turns out that only 27 sorties were required to destroy these destroyers, i.e. 13-14 per ship? 3.) The sinking of the destroyer Stremitelny on 20 July 1941 in Polyarny cost 9 L187 sorties from the [U (dive) group of the 1st training squadron and one raid". For the sinking of the German destroyer 7.34 16 Pe-2 sorties on April 16, 1945 in the Danzig Bay, it was not enough. On the ship, according to German data, only anti-aircraft artillery was seriously damaged - and these damages could

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to carry both the "pawns" and the destroyers of the "Airacobra" that participated in the attack? On August 20, 1944, from 12 to 30 Pe-2s from the 29th and 40th air regiments of dive bombers of the 13th air division of dive bombers of the Air Force of the Black Sea Fleet bombed. [German 1.31 On April 8, 1945, 27 "pawns" of the 12th Guards Aviation Regiment of dive bombers of the 8th mine-torpedo air division of the Air Force of the Baltic Fleet attacked in the Danzig Bay - however, they only managed to damage the enemy ship.

In general, the Pe-2 (like Il-2) does not have a single enemy destroyer sunk - and in fact, in the Baltic in late 1944 - early 1945, German ships of this class acted very actively ... "Stukas" sank 9 Soviet destroyers and leaders (including the "Perfect" that sank on November 12, 1941 in the Sevastopol dock) - "Minsk", "Kharkov", "Frunze" (September 21, 1941 near Tendra), "Guarding", "Swift", "Perfect", "Free" (June 10, 1942 in Sevastopol), "Able" and "Merciless"⁸. They inflicted heavy damage on three more (including the subsequently sunk "Merciless"), and on September 21, 1941, the "Strong" suffered in Kronstadt from only 9 "laptezhniks", and the "Flawless", attacked the next day by the same quantity near Odessa, turned out to be half-flooded?⁹.

You can, of course, point to examples of the frankly unsuccessful actions of the Stukas. So [On December 1941, 15 L187s, bombing the firing positions of the 1st battery of the 196th separate anti-aircraft artillery division on the Western Front in the Kubinka area, managed to disable only one gun - and even then temporarily! ⁰⁰. Apparently, it was the Li87s who were those "dive bombers" that at the end of May 1942, during the offensive of the 16th Army of the

of the Western Front in the Zhizdrinsk direction, they bombed a tank brigade that stood still (!) "There were moments," recalled the former

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commander-16 K.K. Rokossovsky, - when the flame, smoke and dust from explosions of air bombs completely covered the tanks from observation. It seemed that only a pile of twisted metal would remain there. In fact, only two tanks were damaged during the entire time. The 11th Guards Tank Brigade of the Central Front La187 and L188, which fought on the northern face of the Kursk Bulge, was bombed all day on July 7, 1943 - however, only one tank was disabled ...

"But this does not always happen," Rokossovsky added, "and the tankers know about it!"⁰¹. In early July 1942, the "lapezhniks" practically destroyed the fully equipped 116th tank brigade of the Bryansk Front within a few days. "The losses were colossal," recalls P.I. Kirichenko, who served in it then. "... By the time the enemy infantry and tanks approached, our brigade had only a small number of vehicles left."...¹⁰² There is much more evidence in Soviet sources of the high effectiveness of L187 strikes; here are just a few related to the same 1942. In March 1942, Colonel D.S. Sorokin, the commander of the 372nd Rifle Division of the 59th Army of the Volkhov Front, who fought near Spasskaya Polisty (north of Novgorod), complained about "heavy losses" from the "heaviest blows" L187! ⁰³. "Nicking German bombers, five or six times a day, in single file, with a terrible howl, turning on special sirens, dive at crossroads," a former artilleryman from the 311th rifle division of the 54th Army of the Leningrad Front N.N. Nikulin. "The bombs scatter logs, dirt, cars, people [...]"¹⁰⁴. "In half an hour, neither the bridge nor the village itself was gone. Everything that could burn, burned. I managed to gather only 30 people from the battalion, not a single wagon survived," describes the consequences of the L187 raid on the crossing of the Berekau River in the village of Bunakovo (south of Kharkov) on May 25, 1942. V.F. Ropotov, who then commanded the 3rd battalion of the 973rd rifle regiment of the 270th rifle division in the army group of Major General L.V. Bobkin¹⁵. And here are the results of the Stuka raid on the retreating along the forest road near Bely (southwest of Rzhev)

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a column of troops of the 39th Army of the Kalinin Front on July 5, 1942. "During the entire war, I have not seen anything more terrible," recalled B.P. Polyakov, who was then serving as a communications officer in the 634th Infantry Regiment of the 119th Infantry Division. The large funnels were already filled to the brim with water.

The road was littered with broken carts, motor vehicles, dead horses, corpses of people. A particularly dense heap of warped vehicles and guns encircled [...] lakes co. [...] It cost us a lot of effort to make our way through the incessant blockages of fallen trees and piles of equipment" 106.

Here it is necessary to mention such weapons of the "Stukas" as their famous sirens, which, when the aircraft dived, emitted "a loud howl, at first of a low tone. Then as you approach the ground and pick up speed - higher and higher and louder and louder. Near the ground, this is already some kind of unbearable piercing screech! Aircraft designer A.S. Yakov Lev in his famous book made it clear that this could only intimidate British colonial soldiers! (presumably Indians). However, A. I. Shchukin, who fought in the 140th Infantry Division near Rzhev in the summer of 1942, testifies that the "piercing, howling sound" of sirens "depressingly affected the psyche" of Soviet soldiers as well. "More than once," he writes, "I have seen people completely lose their temper, rush about in a panic, looking for shelter, and, as a rule, become victims of such "psychic" bombings." E.L. Balakina (Nazarova), who served in June 1942 in the medical unit of the 59th rifle brigade of the 2nd shock army of the Volkhov Front, writes about the same thing: when L187 "turned on the hellish siren, from which the blood ran cold", the wounded "began to thrash about in horror." "I don't know of a stronger psychological impact on a person in a war than the whistle of a falling bomb under the howl of a dive bomber," says V.A. . on the Narva bridgehead captured by the 2nd shock army of the Leningrad Front across the Narova River)!193. According to F.N. Segeda, who served in 1942 in the 592nd battery

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9th Anti-Aircraft Artillery Regiment of the Baltic Fleet, sirens also interfered with anti-aircraft gunners: in em. Both skill and endurance are needed here! 10. The effectiveness of the Laptezhnikov sirens is also evidenced by the fact that in the summer of 1943, the Air Force Research Institute, having tested the captured L18 70-3, recommended releasing an experimental batch of these devices.

4. WHY WAS THE STUCK PUNCH SO EFFICIENT?

The high effectiveness of the Stuk bombing strikes was due primarily to the high accuracy of the bombing. Here, firstly, the use of its most accurate method - from a dive - and the excellent adaptability of the La87 aircraft to apply aiming

dive strike. Due to the high strength of the design, the "lappet" could attack targets from a steep dive - at an angle of 60-90 ° (for IL-2, as we remember, the limit was 30 °). Many episodes are described in German sources when the Stukas swooped down on the target quite vertically, so that "the wings of the aircraft vibrated, making high-pitched sounds, like a ghostly metal drum." But the closer the dive angle is to 90°, the more the trajectory of the dropped bomb coincides with the aiming line... The 187 dived steadily, without roaring and, what is very important, had a relatively low steady dive speed - 450 km/h at an angle 70° dives (here, by the way, not only special brake grids helped, but also the notorious non-retractable landing gear of the "lappeteer" - which created significant aerodynamic resistance)!¹². This gave the L187 pilot more time to aim than the Pe-2 pilot, whose machine (because of its greater weight and greater aerodynamic perfection) accelerated to 680 km/h in a dive!¹³. In addition, the slower dive "lappet" had less inertia

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and, consequently, the exit from the dive could begin at a lower height compared to the "pawn". This means that he could also drop bombs from a height lower than the Pe-2 - i.e. again more accurate! Usually L187s were released from bombs at an altitude of 1500-2000 m, but, according to the testimony of the Germans, they often dived "almost to the very ground"; in any case, they could also carry out bombing from a height of only 300 m (Ober-Lieutenant H.U. "Marat" still managed after that to bring the "Shtuka" - 3-4 meters above the surface of the water - into level flight)! 14. "Pawns", even in the 2nd Guards Bomber Air Corps of I.S. Finally, the La87, which dived at a relatively low speed, obeyed the rudder better than the Pe-2, so that it was easier for its pilot to turn the plane on course if necessary, achieving more accurate aiming. This latter was facilitated both by the magnificent Stuka bombsight and by the pilot's high landing in the cockpit, which provided excellent visibility...

The high level of bombing accuracy was also determined by the high level of training of the Stuka pilots (it was not for nothing that the saying was popular among them: "If you don't train, nothing will work"! 16) and the same huge combat experience of a significant part of them. Among other things, this experience ALLOWED the "piece pilots" to confidently attack and carefully aim even under powerful anti-aircraft fire. "Many inexperienced pilots," testifies H. W. Rudel, "began to worry, but quickly calmed down,

when they heard on the radio that the "old people" laugh at their fears and even allow themselves to joke and hum. [...] Gradually all the pilots acquired the same icy self-possession!"¹⁷.

All this, however, did not exclude strikes against friendly troops; a number of such cases are recorded, for example, in the combat log of the 58th infantry regiment of the 6th infantry division

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9th Army of the Wehrmacht, which defended in August 1942 near the village of Polunino north of Rzhev. However, this took place under conditions when the Soviet troops were continuously attacking and the battle formations of the opponents were approaching to the limit; apparently, such mistakes in war are generally inevitable. In the same journal, we also find reports of successful bombing strikes carried out by "Stukas" at a minimum distance from the forward edge of the 58th regiment!¹⁸ And the private of one of the motorized infantry regiments of the 16th Panzer Division of the 6th Army of the Wehrmacht, A. Rimmer, on July 31, 1942, during the attack on Stalingrad, watched how the Stukas (together with heavy guns) destroyed 12 Soviet tanks, located just 50 meters from the German trenches! ⁹. We emphasize that this evidence is contained in a personal diary; it was made under the direct impression of what he saw and was not intended for publication - and therefore deserves trust ...

The reliability of such evidence is also confirmed by Soviet sources - for example, the memoirs of a former officer of the 233rd (later - 46th Guards) tank brigade D.F. Loza. As it is clear from them, the accuracy of the Stuk strikes was such that at the end of August 1944, during the Yassko-Kishinev operation, in front of the tankmen of the entire 5th mechanized corps of the 6th tank army of the 2nd Ukrainian Front stood in as a vital question: how to avoid a direct hit by an L187 bomb on an M4A2 tank. ("Sherman")? The reality of such a threat is clearly shown by D.F. Loza's description of the "anti-bomb" maneuver, invented then by Senior Lieutenant I.I. Yakushkin from the 233rd brigade. "The tank commander sees how a bomb comes off from the Yu-87 diving on his car. It is getting closer with every second, getting bigger. And the officer, taking into account the trajectory of her flight, corrects the further movement of the Sherman: a jerk forward - and the bomb falls behind the stern of the tank; deceleration or instant stop - the sultan of an explosion in front of the tank! ²⁰. It was the "melmaners" who worked for them - the crews of the 2nd assault (former dive bomber) that gave most of the German dive aces

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noah) squadron "Immelman" ... And the "Things" of the 77th dive-

Noah, bombing on June 23-24, 1941, the positions of the 6th and 42nd rifle divisions of the 4th Army of the Western Front east of Brest, according to the report of Commander-4 A.A. Korobkov, "disabled gun after gun" ! 21. Undoubtedly, only highly qualified pilots could work so accurately ...

The experience of the pilots was especially important for the successful operations of the assault version of the "Shtuka" - the weapons of which purpose were not bombs, but two 37-mm cannon L187S ki VKZ3Z, 7, and the was to fight Soviet tanks. In order to hit the latter as accurately as possible, the Gustavs attacked them from a gentle gliding - at an angle of 15-20° (or even 10-12°)²²: after all, the smaller the dive angle, the faster the aircraft can get out of the dive and the closer, therefore, it can approach the target. However, this method of attack meant that they would have to shoot from a strafing (or almost strafing) flight. And at an ultra-low altitude, it is very difficult for an average pilot to aim: in order not to crash into the ground, he has to concentrate on controlling the machine. (That is why Il-2 pilots with 37-mm NS-37 cannons attacked German tanks from a dive at an angle of 30°. At the same time, they would be forced to open fire from a distance not of 30-100, like "itukapi lots", but 300-400 meters!²³ - but on the other hand they did not fall below 100-150 meters and could aim more or less calmly.) And 1870 - because of the long and heavy guns suspended under the wing - was very difficult for someone to pilot ... But the most experienced Pilots of anti-tank detachments, starting to dive from a height of about 800 m, were able to bring the car to the tank at a distance of only 15 meters - and still managed to pull it out of the dive!²⁴ They managed to aim accurately, even flying at low level - and not at tank in general", but exactly in the roof of the engine compartment, which was covered with the thinnest armor! (Theoretically, hitting these horizontal armor plates at an angle of 10-20°, the shells should have ricocheted. But, apparently, the Germans managed to hit the mesh or blinds above the ventilation hatches in the armor.) Note that the error

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aiming here could not be adjusted due to the dispersion of a large number of fired shells: the rate of fire of the VKZ,7 guns was rather low, and the L187S ammunition load consisted of only 24 shells (against 100 Il-2 with NS-37 guns)²⁵. Therefore, the successes achieved by the L187S attack aircraft in the fight against Soviet tanks further set off the highest qualifications of the years.

chiki of these aircraft.

And the Soviet side also recognized the high effectiveness of the actions of L187S. Already after the debut of this machine in the Battle of Kursk in July-August 1943, the Soviet command "was seriously concerned about the increased capabilities of German aviation to defeat our armored vehicles"²⁶. According to the headquarters of the 1st Tank Army of the Voronezh

front, the effectiveness of the L18 7S turned out to be "undeniable"!27. Indeed, on August 12, 1943, near Vysokopolye (south of Bogodukhov), 8 tanks went out of action from one of their raids in the 200th tank brigade of this army!28; since in the Kharkov area the Germans then had - as part of the 10th (anti-tank) detachment of the 2nd dive squadron - no more than 10 L187S, no more than 1 aircraft departure. The Soviet counterparts of the L187S, the Il-2 with NS-37 guns, required at least 15 sorties...!2? The question of creating a self-propelled anti-aircraft gun, "which could follow directly in the battle formations of tanks and self-propelled artillery", V.I. .130

Worthy of attention is the content of radio communications of Soviet guidance officers intercepted by the Germans with fighter pilots, who were supposed to attack the anti-tank Stukas, intercepted by the Germans. It also testifies to the high effectiveness of L187C0 actions. So, in August 1944, during the fighting near Vilkavishkis on the border of Lithuania and East Prussia (where the 2nd Guards Tank Kornus of the 3rd Belorussian Front then broke through), the guidance officer under

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he outlined that the approaching L187s were "for sure a group of Lieutenant Colonel Rudel, who always knocks out our tanks." "A lone "lappet" with two stripes intends to attack our tanks - I am sure that this is the fascist bastard who burns our tanks [...]" ; "Don't you see that one tank is already on fire?!" - the Germans heard such replicas on the air in late October or early November 1944, when Rudel on L187S attacked a tank column north of Kecskemét in Hungary (from where the 2nd and 4th Guards Mechanized Corps of the 2nd Ukrainian front)!31.

In 1944 (as evidenced, in particular, by the same H.W. standards...

The accuracy of the Stuka bombing strikes was supplemented by the significant power of the bomb salvo for a single-engine aircraft. The normal bomb load of the L187V was only 500 kg, but in practice, "Berta" lifted 700, and 1000 kg!33. And on the Dora (71870), the maximum bomb load was already brought up to 1800 kg (and the normal one - up to 700 kg). Thus, from 1942, the "lappeters" began to surpass in this indicator not only the Il-2 (400 kg of bombs, and an overload - 600), but also the twin-engine Pe-2 (respectively 600 and 1000-1200 kg)!34. In practice 1870

usually they took on board 700 kg of bombs (this was, for example, the usual load of the aircraft of the III group of the 1st dive squadron in the spring of 1943) - however, during most of the war, no more (600-750 kg) were usually raised by Pe -2...135

Larger than the Soviet machines, was Li87 and the maximum caliber of the bombs used. Unlike the Stukas, the IL-2 could not carry 500 kg bombs and practically did not use 250 kg (only 100 kg or less), and the Pe-2 could not carry 1000 kg - while 187) Sobny were lift and 1800-kilogram. This, in particular, significantly increased the effectiveness of Stuka strikes on tanks and ships. Since a direct hit

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penetration into the tank was still unlikely, the effect of the bombing directly depended on the distance from which the tank armor was pierced by fragments of bombs that exploded away from the vehicle. And here, the 250- and 500-kg L187 bombs would, of course, have all the advantages over the 50- and 100-kg IL-2 bombs ... In the same way, the ship could receive heavy damage not only from a direct hit, but also from close explosion of a large-caliber bomb: this caused such a hydrodynamic impact that a hole of several tens of square meters was formed in the board.

5. WHY WERE THE "LAPTEHNIKERS"
CONSTANTLY HANGING OVER THE BATTLE FIELD?

The high effectiveness of the L187 bombing strikes was multiplied by the highest intensity of use of these aircraft. Complaining about German dive bombers constantly hanging overhead is a common place in the memoirs and diaries of Soviet participants in the war. Here are just a few of these testimonies relating to September 1942; the first of them belongs to I.I. Maslennikov, a staff officer from the 618th Infantry Regiment of the 215th Infantry Division of the 30th Army of the Western Front, which was then advancing on Rzhev. According to his diary entry (possibly processed later) on September 1, 1942, in the Rzhev region, "enemy aircraft appeared at sunrise, and there was no free sky until sunset. Yu-87 and Yu-88 all the time hung over our battle formations and our second echelons. Before one echelon of Junkers leaves, a second echelon appears on the horizon and sets from the sun [...]"136.

On September 12, 1942, the commander of the 861st Infantry Regiment of the 2nd Shock Army of the Volkhov Front described the same picture in his diary, advancing on Sinyavino (near the southwestern tip of Lake Ladoga) and attacked by L187, L188 and Ne! 11: "Enemy aircraft are bombed all the time. The whole earth trembles from bomb explosions. It seems that it-

They want to raze everything to the ground. Their war machines are coming

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bombing, bombing"!37 (the quotation is translated back from the German).

The same thing happened in those days at the other end of the huge Soviet-German front, near Stalingrad. The pages of memoirs of V.I. over the Volga!38. And on September 12, 1942, the responsible editor of the Red Star, D.I. Ortenberg, was located north of Stalingrad, at the location of the 173rd Rifle Division of the 24th Army of the Stalingrad Front. "German aviation also dominates here," he wrote later. "She is constantly attacking our infantry. There is a wild howl in the air. These are howling special devices on the planes [in fact, on the fairings of the landing gear. - A.S.] bombers "Yu-87" [...]" The writer K.M.Simonov, who was accompanying Ortenberg, counted that day 390 dive-bomber sorties over units of the 173rd division...!

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On September 22, 1942, "Stukas" from the 2nd dive squadron bombed the floating craft in Stalingrad all day, providing the central ferry across the Volga. On the same day, L187 raged southeast of Leningrad, where the Germans began an operation to encircle the Soviet 2nd shock army that had broken through to Sinyavin. And on September 29, they also joined the operation "Michael", which unfolded south of Staraya Russa, an offensive to expand the famous "Ramushev corridor", through which the communications of the German group, which occupied the Demyansk ledge, passed.

And this despite the fact that in September 1942 in all combat units of the Luftwaffe there were only about three and a half hundred L187 (on | July there were about 340, and on | October - 365)!140 And in the Soviet-German at that time there were only about 275 of them on the front: three of the twelve dive groups of the Luftwaffe fought in North Africa.

Even more impressive examples of the intensity of use of the L187 are the fighting in the northern

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wing of the Soviet-German front in the spring of 1942. So, at the end of March, "Stukas" continuously bombed both units of the 59th Army of the Volkhov Front north of Novgorod (where they tried to release the 2nd shock army surrounded in the Luban "cauldron") and troops of the 11 th and 1st shock armies Se-

Faith-Western Front southeast of Staraya Russa (where the Germans were already advancing on the connection with their grouping in the Demyansk "sack") ... But in March 1942, the Germans in the entire northwestern strategic direction had (as part of the 1st air fleet) only two groups of "Stuk" (III group of the 1st and [group of the 2nd dive squadron), i.e. only about 60 L187s, of which only about 30-35 were combat-ready! And in the vaprele - three groups (the P group of the 2nd squadron was added), i.e. about 90 "laptezhnikov", including no more than 50-60 combat-ready⁴¹. And at the same time, they helped their troops in Pogostya (south-east of Leningrad), and in Staraya Russa, and at Kholm - in the zone of three Soviet fronts: Leningrad, North-Western and Kalinin - and even bombed Soviet ships on the Neva ...

In general, on the Soviet-German front, the Germans never had more than 540-550 L187⁴²? - but these few machines compared to the Soviet Il-2 did not stand idle, they worked with maximum efficiency! In Chapter III we have already shown how much more intensively the pilots of the German ground attack aircraft flew compared to the Soviet ones; Let us now turn our attention only to the load placed on the "pilot" (and his plane) during the day. Captain A. Burst from the [group of the 2nd dive squadron, operating from July 25 to August 28, 1943 against the Soviet troops in the Oryol ledge, made 100 sorties, i.e. for a whole month, performed an average of three summers per day. Lieutenant T. Nordmann from the 3rd group of the 1st dive squadron with | February to about March 20, 1943 completed 200 sorties, i.e. for a month and a half, he took to the air an average of four times a day. The crews of the 2nd squadron worked with the same intensity in Belarus in June 1941, and during the fierce battles in the Oryol region in the summer of 1943, he fought in Sh

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For the Immelmann group, Captain H.U. Rudel flew out on combat missions an average of five times a day for three weeks: from July 24 to August 12, he made 100 sorties⁴³. At least (even, most likely, more often) the Stukas of the 1st Air Fleet, which opposed the three Soviet fronts, took off in March 1942 (this month, for each serviceable bomber of this fleet, there were 4 sorties per day, but the L187 operated much more intensively than the twin-engine bomb carriers L188 and He 11, which were based farther from the front line).

If the airfields were very close to the front line, then the "laptezhniks" flew out on combat missions and even more often. As we have already seen, in the first days of the Battle of Kursk, the pilots of the III group of the 1st dive squadron made 5-6 sorties a day. For comparison: the attack aircraft of the 16th Air Army of the Central Front operating in the same area on July 5, 1943, having 109 combat

crews and 267 serviceable Il-2s, made only 225 sorties - an average of about 2 per crew and 0.84 per aircraft. And in the 2nd Air Army of the Voronezh and 17th - South-Western Fronts, the intensity of use of the Il-2 turned out to be even less than - 372 sorties for 359 combat-ready crews and 488 serviceable vehicles, i.e. just about 1 sortie for the crew and 0.76 for a serviceable vehicle ... 145 On May 30, 1944, at the beginning of the German-Romanian offensive near Iasi, Lieutenant V. Shtaler from the III group of the 2nd assault (former dive) squadron completed 10 sorties, and on May 31 - 8. Near Stalingrad in December 1942, the pilots [of the Immelman group] made ten sorties a day, and Lieutenant H.U. Rudel took to the air 17 times one day! 146

Let's pay attention to one more circumstance. In September 1942, on the entire Soviet-German front, the Germans, as already noted, had no more than 275 Stukas - almost an order of magnitude less than the Il-2 on the Soviet side. Nevertheless, L187, as we have seen, did not give the Soviet troops peace almost everywhere where the Wehrmacht was then solving the most important strategic tasks - near Sinyavin, where the Germans

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sought to prevent the release of Leningrad; near Rzhev, where the enemy had to keep the Rzhev-Vyazma ledge hanging over Moscow; near Stalingrad, where he tried to cut the communications through which Baku oil flowed ...

Thus, not only the designer H. Pohlmann and other engineers of the Junkers firm, not only experienced pilots, but also German aviation commanders made the L187 aircraft a formidable operational-tactical weapon. It was they who, skillfully organizing an airfield maneuver and a maneuver with radii (i.e., actions in different directions - say, along the Sinyavin area and along the "Ramushev corridor" - from one airfield), ensured the timely concentration of relatively few "Stukas" on the most important at the moment, sectors of the Soviet-German front. It was they who - again compensating for the relative small number of these aircraft - ensured the highest intensity of their use - having achieved the efficient work of the rear services, supplying the airfields with fuel and ammunition, and establishing reliable communications with the ground forces. Communications officers from the dive groups were constantly in the infantry and tank units, timely calling their L187s to help them by radio and pointing them at the target⁴⁷. The speed with which the "lapemen" came to the rescue of their ground troops is constantly noted in the memoirs of Soviet front-line soldiers...

6. ABOUT THE COMBAT WORK OF ATTACK PLANTS AND FIGHTER-BOMBERS RV190E I S

Since 1944, the Focke-Wulf E \! 190 became the main aircraft of the German attack aviation in modifications of two families - E (attack aircraft with a load of bombs and offensive machine-gun and cannon weapons) and C (fighter-bombers that did not have machine guns ; until April 1943, the aircraft of both families were designated by the same letter index "A" as the fighter planes

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modification, but with the addition of indices 01, 03 and 08 through the fraction). The Germans hoped that these much faster and better armored aircraft would suffer fewer casualties than the 187. It was believed that, freed from bombs, the E \! 190 would turn into a full-fledged fighter and be able to confidently stand up for itself in battles with the Soviet "hawks".

However, the E\!190 did not have any advantages over the "Stuka" here. So, in those seven days of the German offensive on the southern face of the Kursk Bulge, for which the corresponding data were published (July 5, 7-9, 11, 12 and 14 July 1943), equipped with "Focke-Wulfs" | cadre (1st formation), according to the reports of the service of the quartermaster general of the Luftwaffe, irretrievably lost 21 E \! 190A-5 / OZi E-3. During these days, German attack aircraft made 1,444 sorties over the southern face of the Kursk Bulge, in which 9 Henschels (2 N\$123 and 7 Nz129)148 were also killed. Thus, for one irretrievably lost attack aircraft, there were 48 sorties, and even if we assume that the more tenacious Fokkers died less often than the Henschels, the number of sorties for one irretrievable loss they still cannot turn out to be more , than that of the "Pieces" (for which it was 160149 during these seven days - when after 4324 sorties they wrote off 27 cars). In July-August 1943, in the 1st assault squadron, there were about 50 sorties for one Fokker that was lost without recovery! 50; even if we take into account only combat losses, then even then this figure will not reach even 100 ...

Exactly the same was the level of losses of E\! 190E-8 in the assault air units operating in the summer - autumn of 1944 over Northern Belarus and the Baltic states. According to the same data from the service of the Quartermaster General of the Luftwaffe, in the III group of the 3rd assault squadron for July - August of the 44th, he amounted to about 40 sorties for one irretrievable loss, and in the Shgroup of the 4th assault squadron for the period from July 4 to October 27, 1944 - 52 (after 2559 sorties, 49 aircraft were decommissioned)! 5!. Meanwhile, in the battles of L187 in the battles of late May and early June of the 44th in the Yass region, this ratio exceeded, as we have seen, 160:1. In the 1st assault

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The (former dive) squadron - which then used both Fokkers and Stukas - apparently did not have such a big gap in the summer of 1944, but all the same, in terms of the number of sorties for one irretrievable loss, the first "did not exceed" the second! 2. Evidence that the replacement of L187 with E190 did not bring the expected effect is the decision in June 1944 by the Germans not to use Fokker attack aircraft in areas of high concentration of Soviet fighters! 33. (However, new aircraft suffered no less from anti-aircraft fire; for example, in the III group of the 3rd assault squadron in July - August 44, about the same number of aircraft was lost from it as from fighters! 5 "4.)

True, at the end of 1944, the losses of E190E and C, apparently, decreased! 55: these aircraft began to use new tactics. They now approached the target at low altitudes, and after dropping their bombs, left at low level flight and at maximum speed. This, firstly, made it difficult for Soviet "hawks" to detect them: flying at an ultra-low altitude and covered with gray matte paint, the "Fokker" was difficult to distinguish against the background of the earth's surface. Secondly, even the detected outgoing attack aircraft became almost impossible to intercept. After all, the E190E-8 that were then used near the ground developed 582 km / h in afterburner - while the few and unreliable Yak-9U - only 575 km / h, Yak-3 - 567 km / h, and others "yaks, La-5, La FN and Aerocobras - even less. In horizontal flight, only La-7 (developing the land at afterburner 612 km / h) could catch up with the outgoing Fokker, and even then more theoretically: approaching the distance of aimed fire was too slow! Of course, the fighters could gain the necessary speed while diving, but it was very dangerous to attack an aircraft flying at low altitude in this way - there might not be enough height to get out of the dive ... Thirdly, the transition to low and ultra-low altitudes helped to reduce losses from anti-aircraft fire: when an anti-aircraft aircraft flying at these heights was fired at, the chicks were prevented by the large angular displacement of the latter. Yes. And it was too late to find such "Fokkers"

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but - only when they suddenly burst out from behind the forest or the folds of the terrain.

However, at the beginning of 1945 (at least during the February massive attacks on the troops of the 1st Belorussian Front that had broken through to the Oder), E190E and C (for reasons that are still unclear to us) again began to move towards the target cell of 2500-3000 m. In conditions when the Soviet military air defense was already using radars, this facilitated the interception of "Fokkers" by fighters and the timely production of anti-aircraft gunners for firing, and the increased training of the latter and the high density of anti-aircraft weapons also reduced the effect of the Germans used anti-aircraft

maneuver (although it was carried out both in height, and in direction, and in speed). As a result, the losses of E \! 190E and C increased again.

The reasons for the higher level of losses of E\!190E and C compared to the "obsolete" L187 are seen, firstly, in the fact that they (like the IL-2) were not dive bombers, but attack aircraft. It was easier for anti-aircraft gunners to hit the attacker from a flat dive or from a horizontal flight E \! 190 than to continuously change the altitude of the L187; in addition, the attack aircraft were forced to stay longer in the zone of the most dense anti-aircraft fire - where the aircraft could hit not only medium, but also small-caliber guns. Secondly, many pilots [V190E and C] have just transferred to these machines from L187, L188 and He! 11, i.e. completely different aircraft - they were inferior to the bulk of the "stuff pilots" in the level of flight and tactical training. Thus, in the spring of 1944, the Germans allowed only 6-8 weeks for the retraining of bomber pilots, and those who were retrained managed to make only 15-20 training sorties on the E\! 190!57. Once in combat immediately thereafter, some out of habit piloted a fast single-engine Fokker as well as a heavy twin-engine bomber—and could not evade attacking fighters or anti-aircraft fire by skillful maneuver. So, when on August 10 (or 17), 1944, Guards Captain F.F. Arkhipenko from the 129th Guards Fighter Aviation Regiment of the 205th Fighter Aviation Division

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Noah army of the 1st Ukrainian Front over the Sandomierz bridgehead went into the tail of E \! 190y "the German pilot, instead of making a maneuver and getting out of the fire, only shifted the plane from wing to wing"! 38. Naturally, THIS "Fokker" was hit by the fire of the "Aircobra"

However, being higher than that of L187, the level of losses of E \ / 190E and C was still lower than that of IL-2. In the summer of 1943, the gap here was even threefold (about 50 sorties for one irretrievable loss in the EU! 190E against 16-17 operating over the same southern front of the Kursk Bulge II-2). In the summer of 1944, one "silt" of the 3rd Air Army of the 1st Baltic Front was lost, as we have seen, in 36 sorties, and one "Focke-Wulf" operating in the same Northern Belarus, Lithuania and Latvia of the III group of the 3rd and III groups of the 4th assault squadron - at 40-50; by November, the indicated ratio for the IL-2 increased to 70, but (as noted above), apparently, the relative losses of E\!190E and C also decreased ...

When evaluating the effectiveness of the EV190E and C bomb-assault strikes, it must be taken into account that representatives of the Soviet ground forces - on whose evidence one can only rely here - very often could not correctly identify these aircraft. They were praised not only

"Messerschmitts" (it is really very difficult to distinguish the strike version of the E \ \ 190 fighter from the same single-engine fighter "Messerschmitt `BE109"), but also the "Junkers" - a former member of the Military Council of the 1st Guards Tank Army N In his memoirs, K. Popel called the "stupidly snouted, short-winged" aircraft he saw in July 1944 in Poland "hein kels"!59. It is possible to determine where we are talking about E \ 190 attack aircraft, and where really about 1870 dive bombers, according to the description in the source of air strike tactics - and sometimes at the scene of action (there were areas in which only E \ 190E and C operated, or only L1870); "Messerschmitt" in 1944-1945. there was no time for strikes against ground troops. But the fact that the main ground attack aircraft is about

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The enemy managed to be confused even with the "Junkers" and "Heinkels", one can also see an indication that the new German "battlefield aircraft" did not make much of an impression on the Soviet troops. Undoubtedly, the aircraft, which operated with the same efficiency as the dive bomber 187, would have been known in the Red Army as well as this last one ...

Nevertheless, the evidence of Soviet sources introduced into scientific circulation today confirms the conclusion made (although not provided with detailed arguments) by A.N. Medved and D.B. Khazanov: "We must admit that the Soviet ground forces suffered serious losses from the actions of the "Focke-Wulfs", especially from the most trained and successful pilots against the nickname! 60. Thus, in the memoirs of the former officer of the 49th mechanized brigade of the 6th guards mechanized corps of the 4th tank army of the 1st Ukrainian Front, E.I. S - so what? Here is the Proskurov-Chernivtsi operation: on March 15, 1944, near the Galician Skalat, under the bombing of about 10-12 of these aircraft, the tank regiment of the brigade "immediately suffered losses in tanks and personnel," and on March 24 in the area of Kamianets-Podolsk "Fokkers" "almost completely destroyed" the motorized rifle battalion in which Bessonov served: "We suffered heavy losses in personnel, and

tank regiment - in tanks. Others got no less." Here is the Lvov-Sandomierz operation, the throw on Lvov in July 1944: bombing and assault strikes from low altitudes on the Bessonov battalion planted on tanks brought "losses in tanks and personnel." The brigade (which has already become the 35th Guards Mechanized) "had a lot of hits" from E \ 190E and in the Berlin operation; so, on April 23, 1945, they inflicted "significant losses" on it "both in people and in equipment" (several tanks and more than a dozen trucks were only burned down)!61. "Losses were growing," the veteran of the 170th Tank Brigade, V.P.

Nai near the Yugoslav Sombor to the 18th Panzer Corps

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3rd Ukrainian Front in late November - early December 1944.¹⁶² Of course, the commander of a separate motorcycle regiment of the 1st Guards Tank Army of the 1st Ukrainian Front, Major V.N. - when he reported on July 29, 1944, leaving during the Lvov-Sandomierz operation to the Vistula in the Baranow region, that "enemy fighters at low level flight burn everything that comes into view"! ⁶³.

And here are the German counterattacks with the aim of deblocking Buda pest: according to the Soviet side, only on January 3, 1945, in the Bayna area (north-west of the Hungarian capital), the Fokkers from the 2nd or 10th assault squadron burned 13 and knocked out 3 tanks and self-propelled artillery installations of the 18th tank corps of the 3rd Ukrainian Front (14 T-34 and 2 ISU-122), and on January 4 - another 5 heavy self-propelled guns ISU 122164, In the Vistula-Oder operation (January 1945) Luftwaffe due to bad weather and a number of losses, advanced airfields did not show much activity - and nevertheless, 10.5% of the combat losses in tanks and self-propelled artillery mounts suffered in this operation by the 1st Guards Tank Army of the 1st Belorussian Front fell to the share of aviation!⁶⁵, i.e. first of all (if not exclusively) over the E \ / 190E and C (after all, they then constituted the bulk of the Luftwaffe strike aircraft)! Meanwhile, in July [1943, during the defensive operation on the Kursk Bulge, the losses of the same army (also called the 1st Panzer and part of the Voronezh Front) in tanks from aviation amounted to only 2% of the total, and similar losses of the 2nd Panzer army of the Central Front - only 6.5% ... ¹⁶⁶

The E\190 could not drop its bomb load with the same accuracy as the L187, since it was not suitable for bombing from a steep dive - and indeed for bombing in general. Having no air brakes and being distinguished by very good aerodynamics, he developed such a high speed on a steep dive that the pilot simply could not have time to carefully aim. Therefore, if the La87s quite often fell on targets in a completely spring peak and dropped bombs at the 300-meter mark, then the Fokkers dived only at angles of 45-70 ° and

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only up to a height of 1000 or 500 m...¹⁶⁷ In addition, there was no special bombsight on E\190E and C; the pilot had to use the obsolete Kem rifle sight. And when bombing from ultra-low altitudes - to which the "Fokker"-attack aircraft resorted quite often - even Ke \! could not help. Here, the pilots of the Fokkers - like the pilots of the IL-2 - had to aim "by eye",

dropping bombs at the moment when the target (for example, a tank) was completely hidden under the engine hood (and it was not easy to catch this moment, rushing over the target at a speed of about 480 km / h!68) ... But there were a number of factors that made the effectiveness of the E \ 190E and C bombing strikes is quite high - bringing it closer to the level of not IL-2, but 187.

Firstly, this is the large caliber of the bombs used - which, in turn, was allowed by a very solid bomb load for a single-engine vehicle. The E-1 (A-4/03), E-2 (A-5/03), E-3, B-1 (A-5/08), C -2 and OV-3, it was 500 kg, for the C-8 manufactured in the fall of 1943 - in the spring of 1944 - 1000 kg, for the E-8 that replaced it in the spring of 1944 - 700 kg¹⁶⁹, i.e. more than the IL-2 and the same as the twice as heavy twin-engine Pe-2. Usually, however, only 200-500 kg were suspended!⁷⁰, i.e. on average, no more than under the IL-2, but, unlike the latter, the loading of the Fokker, as a rule, included powerful large-caliber bombs - 250- and 500-kilogram (five hundred, we recall, IL -2 could not lift at all). The use of large-caliber bombs with their most powerful shock wave and large spread of fragments retaining sufficient penetrating power largely compensated for the inaccuracy of aiming when hitting, for example, tanks. E.I. Bessonov describes a case when, on April 23, 1945, during an E\190 raid on a column of the 35th Guards Mechanized Brigade of the 6th Guards Mechanized Corps of the 4th Guards Tank Army | Berlin, one of the T-34s from a close bomb explosion was slightly raised into the air, "and the tank gun almost

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pulled out of the tower, putting it in a vertical position [probably with a breakdown of the lifting mechanism. - A.S.] "...! 7!

Secondly, the effectiveness of E\190E and C bombing strikes was increased by their widespread use (again, unlike the IL-2) of cartridges with small fragmentation bombs - covering a large area at once and compensating for the inaccuracy of aiming when hitting manpower . Explosions of these bombs, according to I.A. Tolkonyuk, who observed their action in [94] and 1943, formed "a continuous veil of fire mixed with fragments. In the area that fell under this veil, all living things perished and burned!"⁷². So, on July 8, 1943, repelling a counterattack by the troops of the Voronezh Front on the southern face of the Kursk Bulge, the Focke-Wulfs of the 1st Assault Squadron (1st formation) deprived the advancing tanks of the 2nd and 5th Guards Tank Tanks in this way. infantry support corps, forcing the infantry following the tanks to lie down. Apparently, on August 2, 1944, these same cassettes ensured the effectiveness of bombing attacks from ultra-low altitudes on the troops of the 8th Guards Army of the 1st Army crossing the Vistula.

Belorussian front. According to the report of the representative of the General Staff, Lieutenant Colonel Drabkin and the testimony of the former commander of the 8th Guards V.I. building a "large number" of boats and boats and thereby slowed down the transfer of troops and equipment to the Magnushevsky bridgehead! 7 "3.

Thirdly, apparently, the good training of the pilots had an effect. Only this can explain the very high percentage of direct hits by bombs that did not have a bomb sight, "Focke-Wulfs" on such point targets as small ships and ships and boats. Here is a list of direct hits on these targets, which were achieved by operating in March 1943 - June 1944 over the Barents Sea, fighter-bombers and attack aircraft E \! 190A-3 / 03 and A-4 / 03 (E-1) 14 -th (fighter-bomber) detachment of the 5th fighter squadron "Aismeer" (from February 1944 - the 4th detachment of the 5th assault squadron): May 11, 1943 - in the trawl boat No. 1.04, May 12 - to the patrol ship SKR-31, May 14 -

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in the submarine M-122, on May 26 - in the drifter MB-3, on July 21 - in the small hunter MO-123, on August 18 - in the drift ter PMB-61 and patrol boat No. 42 (three hits each), on August 19 - in patrol boat No. 9 (two hits), on September 12 - in the M-37 tugboat, on September 23 - in the Kildin drifter and the Venera schooner, on October 6 - in the small hunter MO-124, on May 9, 1944 - trawler T -886 and patrol boats MO-435, MO-437, MO-439 and MO-443 (all affected boats, ships and ships sank)! "4. These 22 direct hits were achieved in the course of only about 90 sorties, and when hitting MO-123, the percentage of direct hits was 20 (one out of five dropped bombs), while hitting MB-3 - 25 (one out of four); during attacks on the PMB-61 and boat No. 42, about a third of the attacking Fokkers managed to put a bomb directly on the target; - 40%, when hitting M-122 and T-886 - 50% (one of the two attackers), and when boat No. 9, "Kildin" and "Venus" are sunk - 100% (each of the two attackers) 17 ° .

As for the effectiveness of the machine-gun and cannon fire of the "Focke-Wulf"-attack aircraft, then with the help of the offensive small arms and cannon weapons E \! 190N-1, E-2 and E-3 (two 20-mm 7.92-mm machine gun MO 17) outperformed the Il-2 with ShVAK guns (the damaging effect of lighter projectiles of which was noticeably less) and was not inferior to the "silt" with VYa guns. And the E \! 190E-8, on which instead of rifle-caliber machine guns were 13.1-mm MO 131, was superior to this latter. Of course, the same high qualification of German attack pilots also had an effect - at least those who had previously flown the same single-engine B1109E fighters used as attack aircraft, and those who had extensive experience in combat work on the L187 . Above we

we saw what amazing successes in firing from cannons were achieved - and, moreover, very quickly - by experienced "thing pilots", switching from a dive bomber 187) to an attack aircraft 1870; the more understandable are the successes of those who moved to a more stable and better controlled E\190 ... Member of the Baltic strategic operation V.T. Fedin - who fought then

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when in the 183rd tank brigade of the 10th tank corps of the 3rd Baltic Front - he recalls how on September 24, 1944 near Valmiera in Latvia, E \! 190 "rolled a machine-gun burst" "exactly" into the open hatch of the loading tank T-34-85 - the hatch, on the side of which he, Fedin, had just sat! 6. And the day before, on September 23, V.P. Bryukhov, who was then serving in the 170th tank brigade of the 18th tank corps of the 2nd Ukrainian Front, witnessed how at Battonya on the Romanian-Hungarian border the troika "foreground Kerov" (erroneously taken by the memoirist for "Messerschmitt") put a projectile into the transmission compartment of the first T-34-85 attacked by her on a low-level T-34-85. Thus, to destroy one tank with cannon fire, the E\190E pilots needed only 3 sorties - in the Soviet Air Force, in order to guarantee the destruction of the cannons of one tank in one run, it was required, as we saw above, to send 15-25 attack aircraft! This message from the Soviet memoirist makes us trust the German source, according to which, the German infantrymen defending the Courland bridgehead testified that on December 25, 1944, three E \! 190E-8 from the III group of the 3rd assault squadron, led by Captain E. Yenert, destroyed by cannon fire 7 Soviet tanks that broke through the German positions!"7. If we assume that Yenert's troika made three passes, then three Fokkers turned out to be just as effective as 45-75 Il-2s with NS-37 guns. But after all, Yenert began serving in ground attack aviation even before the war, and by the end of the 44th he already had about 550 sorties on 187 and E \! 190E! 78 (recall that almost none of the Soviet attack aircraft pilots during the entire war managed to overcome milestone of 400 sorties). The fact that sufficient combat practice is of decisive importance in the art of shooting at ground targets is also confirmed by A.I. Pokryshkin....!79

The high effectiveness of E\190E bombing attacks suggests that, in general, the combat effectiveness of this aircraft turned out to be higher than that of the IL-2 - the complete superiority of which over the "Fokker" as an attack aircraft was so often said in domestic literature

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(It is characteristic that the last of the works that touched on this issue and appeared before the release at the end of 2005 of the first edition of our book, this superiority is no longer

80, and in 2008, M.V. Zefirov and D.M. Deyogtev even considered it possible - unnecessarily, perhaps boldly - to declare that already the E \ / 190E-3 "in terms of its characteristics was head and shoulders above the Il- 2 sample 1943" and that, thanks to the transition to the Focke-Wulfs, "German assault aviation at the last stage of the war received a significant qualitative advantage over the Soviet"! 8!).

Let's also not forget that the E\190E and C aircraft, like the L187, were used more rationally than the Il-2 - being incomparably smaller in number, they flew much more intensively. As early as May 31, 1944, the Germans had only 278 E\190E and C on the Soviet German front (which was an order of magnitude less than the number of Il-2s on the Soviet side); on November 1, 1944, there were 874 Focke-Wulfs on all fronts in the combat units of the Luf Twaffe assault aviation, and on January 1, 1945 - 1077, i.e. almost four times less than it was then IL-2 on the Soviet-German front alone (4171 on January 1, 1945) at least experienced German pilots still took to the air more often than experienced Soviet ones. For example, K. Kennel, who fought first in the P group of the 1st assault (1st formation) squadron, and then in the P group of the 2nd assault (former dive), for 11 or 12 months at the front (from about September until mid-November 1943 and August 1944 until the end of the war) made on E \! 190 557 sorties - out of more than ten thousand Soviet attack pilots who fought, only three to five people were able to perform so much even during the entire war. K. Plenzat from the G group of the 2nd assault squadron for 14 or 15 months (from the end of the autumn of the 43rd until the end of the war) flew on E \! 190 on combat missions at least 500 times; H. Pölz, who first served in the III group of the 3rd assault squadron, and then in the [group of the 151st, in 11 months (from June 44 until the end of the war) did this 351 times. Meanwhile, I.A. Vorobyov (below we mention

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only twice Heroes of the Soviet Union) from the 76th Guards Assault Aviation Regiment he managed to complete his 324 sorties in only 33 months (from August 42 to the end of the war), and T.Ya. completed sorties in 28 months (since January 43rd)! 83. Pilot E\190E R.Mrkva from the 2nd assault squadron made about 240 sorties in 10 months (from July 1944 until the end of the war), while N.G.Stepanyan from the 47th assault air regiment of the Navy Air Force did the same amount in almost 42 months (from the beginning of the war to December 14, 1944), and 234 departures of M.T. If M.G. Gareev from the 76th Guards Assault had about 200 sorties in 29 months (from September 42 to March 45), then T. Nordmann, who flew on E\ th assault squadron - for only 8 with a sky-high (from May 44 to January 19, 1945), ay

the aforementioned H. Pöltz - and in 4 months at all (from July 24 to November 22, 1944) ... sometimes up to 7-8 sorties per day 85.

7. ABOUT THE COMBAT WORK OF ATTACK ROVERS H \$ 129

Some new conclusions can also be drawn regarding the combat work of the Henschel H \$ 129 twin-engine attack aircraft. More than 60-70 of these machines never operated on the Soviet-German front⁸⁶, but in Soviet literature H\$129 was constantly mentioned - to illustrate the thesis about the absolute superiority of Soviet attack aircraft over German ones ...

Of course, H\$129 had serious drawbacks. This single-seat machine did not have an air gunner covering the rear hemisphere - and meanwhile its maximum speed (355-440 km/h³⁷) did not allow it to get away from the fighters. It was also difficult to dodge attacks: the pilot of the Henschel had practically no view to the rear. All in all,

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H\$129 was very vulnerable in air combat. It is no coincidence that, in terms of combat survivability, it was several times inferior to the L187 aircraft (here, however, the fact that, unlike the dive bomber, the attack aircraft was forced to stay at low altitudes much longer, i.e. in the thick of fire of fast-firing small-caliber anti-aircraft guns). So, in the 1st assault squadron (1st formation) during the battle on the Kerch Peninsula in May 1942. for one H\$129 lost due to combat reasons, only 20 sorties (in 180 sorties 9 aircraft were lost)! 88. Thus, the specific losses of H \$ 129 turned out to be the same as those suffered by the Soviet Il-2 in the same approximate period (August 1942 - May 1943) (26 sorties for one combat loss!) - and must be recognized as very high.

Nevertheless, in this respect, the Henschel was, as we see, no worse than, at least, the single-seat IL-2. We note that Soviet aviation specialists highly estimated the survivability of the fuselage and wing at \$129,190; the cockpit on it, like on the Il-2, was completely booked (which, however, did not save either one or the other aircraft), and the lack of armor protection for the engines was compensated by the fact that these were air-cooled "stars" - much more resistant to hit by bullets and shrapnel than the Soviet water-cooled motor AM-38 ...

The conclusion that "the effectiveness of the use of H\$-129 was not high" also seems premature⁹¹. Here it must be taken into account that the tasks before this "Henschel" were set much less than before the IL-2; it was a specialty

proved anti-tank attack aircraft. And in this capacity, the H\$129 - although they died as often as the IL-2 - managed to inflict much more damage on the Soviet troops than the IL-2 on the German ones. So, in early October 1941, at the beginning of the battle for Moscow, six H \$ 1298V-1 from the P (assault) group of the 2nd training squadron, led by Major O. Weiss, east of Vyazma, were destroyed in three passes with 20-mm fire guns 15 Soviet tanks. This result was confirmed by the infantrymen of the Wehrmacht - fortunately, the tanks broke through into the depths of the location of the German unit!92. Let us remind again

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that in the Air Force of the Red Army, in order to guarantee the achievement of such a result in one run, even in 1943, it was required to allocate 15-25 attack aircraft; consequently, the effectiveness of the actions of one N\$ 129V-1 turned out to be the same as that of 12-21 IL-2 with NS-37 guns! And here is the testimony of the Soviet side: according to the documents of the 2nd Panzer Corps, during the counterattack of the troops of the Voronezh Front on the southern face of the Kursk Bulge on July 8, 1943, "anti-tank" (the bulk of which was H \$ 129 from the compound of Captain B. Meyer. - A.S.) and German bomber aircraft inflicted "very significant losses" on parts of the corps! 33. According to the report of the senior officer of the General Staff at the Western Front, Colonel A.I. Kharitonov, on July 17-18, 1943, during the Oryol operation, shooting north-east of Karachev T-34 and T-70 of the 1st tank corps of the 11th 1st Guards Army of the Western Front, German attack aircraft made 8-10 holes in them! This, of course, refers to the N \$ 1298V-2 with 30- and 20-mm guns, aneo L187S, which were part of the "combat unit" of Lieutenant Colonel E. Kupfer: after all, the 37-mm guns of the latter had too low a rate of fire for the pilot to have time to hit the target so many projectiles. In addition, if at least one shell hit the tank, the "stuff pilots" immediately proceeded to attack the next vehicle ...

The reasons for such a high effectiveness of the attacks of the many times ridiculed H\$129 are simple. Firstly, this machine had a very effective offensive weaponry. In terms of its real effectiveness, the N \$ 129V-1 (two 20 mm MS151 / 20 cannons and two 7.92 mm MS17 machine guns) was already superior to the IL-2 with ShVAK cannons, and the H \$ 1298V-2, which appeared in 1942, was by which also had a 30-mm cannon MK101, surpassed absolutely all IL-2 - iso ShVAK, iso VYa, iso NS-37 ... After all, the Henschel guns were much closer to the axis of the aircraft than those installed in the consoles (or suspended under them) IL-2 guns: MS151 / 20 - in the fairings of the wing, i.e. near the fuselage, and MK101 - under the fuselage. This reduced the aiming error (due to the approximation of the axis of the barrel of the aiming wedge, which

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was the axis of the aircraft) and ensured a much greater accuracy of the battle (fortunately, the effect of wing vibration in flight was excluded or minimized). Thus, the H\$129 turned out to be much better than the IL-2, adapted to hitting point targets (that is, the same KOV tanks).

This advantage of it was especially noticeable in comparison with the anti-tank modification of the "silt" - armed with NS-37 guns. After all, the dispersion of the shells of these latter was also increased by a much greater recoil force than that of the smaller German guns. And the lower rate of fire of the NS-37 compared to the MC151/20 further reduced the chance of hitting the tank. The superiority of the Soviet attack aircraft in the caliber of weapons did not matter: since 1942, the 20-mm H\$129 guns were supplied with sub-caliber shells with a tungsten core, which easily pierced even the armor of medium T-34 tanks.

Secondly, the high level of training of German attack pilots was once again manifested. To hit a tank from a distance of only a few tens of meters, i.e. for sure (and still have time to switch to level flight after that), the H\$129 pilots - like the L187S pilots - attacked from a gentle gliding, i.e. they flew for quite a long time at low or ultra-low altitude. So, the aviators of O. Weiss in 1941 started an attack from a height of only 80 meters, opened fire from an even lower one (and not from 150-200 meters, like the pilots of the anti-tank IL-2 in 1943), but stopped it altogether on the 20-meter; "almost at low level" pilots E. Kupfer also fired in 1943!35. At such a small distance from the ground, the pilot's attention was usually absorbed by piloting the aircraft - however, those who flew on "Henschels" managed to aim accurately too ... The pilots of O. Weiss even managed to catch in sight not just a tank, there were ventilation hatches covered only with a mesh) - and yet they even entered the target through barrage of anti-aircraft fire!

8. CONCLUSION

On the whole, the actions of the German assault aviation should be recognized as much more effective than the actions of the Soviet. Having (except in 1941) several times fewer aircraft than the Soviet one, and with a lower level of losses than the Soviet one, it nevertheless had a significant impact on the course of hostilities - both on a tactical and more than once operational scale . This was achieved:

a) the skillful actions of the German aviation command, which timely concentrated the forces of attack aviation in the most important sectors of the front at the moment;

6) high intensity of use of aircraft

the first park, which was provided by a clear organization of the supply of combat air units with fuel and ammunition;

c) the high flying skill of the majority of German attack pilots and the effective defensive tactics used by the latter - superimposed on the mediocre training of the majority of Soviet fighter pilots and the objective difficulty of hitting a dive bomber (which was the main German "field aircraft" for most of the war). combat") with anti-aircraft fire and

d) the high effectiveness of bombing, bombing and assault strikes, which was achieved both thanks to the powerful bomb volley of dive bombers L187, the effectiveness of air bombs used by attack aircraft and fighter-bombers E\190E and C and the effective small arms and cannon armament E\190E and H\$129 attack aircraft, as well as due to the high accuracy of L187 bombing and E\190E and H\$129 machine-gun and cannon fire. In turn, this high accuracy was ensured by the high level of training of German pilots, the great combat experience of a significant part of them, as well as the almost perfect suitability of the L187 aircraft for delivering high-precision bombing strikes.

In general, in our literature it is traditionally underestimated

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the material part of the German "battlefield aviation" was in full swing. In the meantime, even the E\190 fighter adapted for assault operations surpassed the Soviet Il-2 attack aircraft of a special construction in its combat effectiveness. In this regard, the question posed by M. Pavlovsky looks completely legitimate: did the Germans need an attack aircraft of the Il-2 type (the absence of which in the backlash twaffe our authors considered as a huge shortcoming of German aviation)? The answer given by M. Pavlovsky also seems reasonable: no, it was not needed!96. Indeed, if not all, then three-quarters of the L187 and almost all of the E \190E were superior to the Il-2 in terms of the power of the bomb salvo, over a quarter of the L187 were not inferior in terms of the effectiveness of offensive small arms and cannon weapons, and all E \190E and H \$129 again -they were superior to the "humpbacked" one: 187 provided incomparably greater bombing accuracy, and E \ / 190E - not the worst ... But more powerful armor and better (in a two-seat version) defensive armament of the Il-2 did not at all save these aircraft from much higher than that of L187, and somewhat higher than those of EV190E and C, specific losses - and did not give here any advantage over H\$129.

Notes

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portions decreased and the number of sorties! and 87, it turns out that on the 10th they flew combat missions 295 times (the 9th number of their sorties was 699).

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17 By the beginning of Citadel, 11 groups were operating on the Soviet-German front - three each from the 1st, 2nd and 77th dive squadrons and

one of the 3rd and 5th dives. In ten of them - concentrated in the area of the Kursk Bulge - by July 5, 1943, there were 396 machines (Gorbach V. Decree. op. C. 474); in the eleventh - 1st group of the 5th assault squadron in the Arctic - there could be another 30-40 (the regular number of aircraft in the group was 40). On the number of Ju 87 in the combat units of the Luftwaffe attack aviation as a whole, see: Zefirov M.V. Decree. op. S. 37.

18 See. , for example: Akaliev V.L. Kraluftwaffe in the Battle of Kursk // Military

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25 Zefirov M.V. Decree. op. S. 37; Perov V., Rastrenin O. Decree. op. S. 69.

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29 Ibid. P. 185-186: Khazanov D. Battle over Iasi. P. 19. 30 Calculated according to: Zefirov M.V. Decree. op. P.62-120.

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Part 1]

BOMBING AVIATION

Chapter Y

COMBAT WORK OF THE SOVIET BOMBER AVIATION

By the beginning of the war, the bomber aviation of the Red Army Air Force was subdivided into short-range aviation, which delivered strikes against troops and other objects located in tactical and operational depth, and long-range, whose task was to influence the deep rear of the enemy. At the end of 1941, night bomber and night light bomber aviation stood out; both one and the other, and the third subsequently began to be united under the name "front-line bomber aviation", which we will use below. Actually, we will analyze only the work of Soviet front-line bombers (including long-range bombers used as front-line bombers). After all, Soviet long-range bomber aviation was used for its intended purpose on an extremely limited scale. Night raids by bombers DB-3, DB-3F (Il-4), Yer-2, Pe-8 and V-25 on industrial facilities in Germany were, according to the Germans, "the nature of" pinpricks ", which did not influence on the course of the war! Too rarely and too insignificant forces (groups of several machines, or even completely single aircraft) they were carried out ...

1. HOW EFFICIENT WERE THE SB, DB-3 AND DB-3F DAY FRONT-BOMBERS?

In 1941, the main day bomber of the Red Army Air Force was the twin-engine SB designed under the direction of A.N. Tupolev, which

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began to enter the air unit back in 1936. By the beginning of the war, these machines accounted for up to 84% of the aircraft fleet near

her bomber aircraft?. Almost exclusively as front-line bombers, long-range bombers were also used in the 41st, about 82% of the fleet of which by the beginning of the war were the twin-engine DB-3 and DB-3FZ3, created under the leadership of S.V. Ilyushin, which were in service, respectively, from 1937 and 1940 gg.

The effectiveness of the combat work of these aircraft in 1941 turned out to be very low. As already noted in part C, only the side that was subjected to these strikes can have absolutely reliable information about the results of bombing attacks; in this case, German. And the Germans, officers of the ground forces of the Wehrmacht, whose testimonies were summarized by W. Schwabedissen, noted that the actions of Soviet bombers in the 41st were "very effective" only "on some sectors of the front and in certain periods of time." These sites were located on the southern wing of the Soviet-German front, where since August 1941 the fighting took place mainly in the vast steppe spaces of Eastern Ukraine, Northern Tavria and Crimea. In this open area, the German troops were visible at a glance, and the Soviet bombing managed to inflict "tangible losses" on them - in particular, at the crossings across the Kremenchug Dnieper and on the approaches to Perekop. However, in the northern and central sectors of the front, German experts emphasized, "the situation was completely different." In the first days of the war, wrote, for example, the former commander of the 9th Army Corps of the 4th Army of the Army Group "Center" G. Geyer, we often saw Russian aircraft - sometimes up to 20-30 at the same time. However, they didn't do us much damage. [...] Until the very end of 1941, we suffered surprisingly little from Russian pilots - despite the fact that very many of them managed to drop bombs and fire from airborne machine guns. The testimony of E. Raus, who then fought in the 6th Panzer Division of the 41st Motorized Corps of the 4th Panzer Group of Army Group North, is also characteristic. June 30, 1941, he points out, the bomber raids "slowed down the work"

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on the construction of a bridge for the 6th division across the Western Dvina and Livani, "but they failed to prevent it, although there were only 20-mm anti-aircraft guns to repel the raids"; bombers "inflicted some losses on us," "but in general, X tank [sic. — A.S.] the corps crossed the Dvina without stopping or even delaying."6 True, Soviet bombers achieved some success here as well. So, on July 10, 1941, did the headquarters of the German Army Group North report heavy losses suffered by the 41st Panzer Division of the 41st Motorized Corps of the 4th Panzer Group as a result of numerous air raids? (this was the work of the SB from the 2nd mixed and 41st bomber air divisions of the Air Force of the Northern Front). And on November 28, 1941 the Soviet ground troops confirmed that the six SB of the 150th high-speed bomber regiment of the 46th mixed air division of the Western Air Force

front, with a direct hit, disabled the bridge across the Moscow-Volga canal near Yakhroma. Thus, the advance of the German 7th Panzer Division, which was already bypassing Moscow from the north, was stalled ... "However, the general opinion of German army officers from battalion commanders to army group commanders is that the Soviet bomber raids were not too intense. , had a weak effect and did not slow down the German offensive in any way" in the northern and central sectors of the Soviet-German front.

This opinion, continues W. Schwabedissen, "is confirmed by Luftwaffe officers. Their reports speak of attacks by Russian bombers against tank formations and accumulations of various military equipment, crossings and other important objects during the German offensive. The results of these operations were ineffective due to inaccurate Russian bombing and the opposition of German fighters and anti-aircraft artillery. [...] Soviet bombs caused insignificant damage to equipment and manpower"?.

Indeed, it suffices to refer to the results of the largest of such operations by Soviet bombers in 1941 - to the results of attacks on German tanks and

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rights across the Western Dvina near Dvinsk (now Daugav Pils) and the Berezina near Bobruisk on June 27-30, 1941. At first, DB-3 and DB-ZF of the 1st long-range bomber aviation corps (DBA) worked on the bridges in Dvinsk; On the 30th, they were bombed by 93 SB, DB-3, DB-Z3F and Ar-2 (a dive bomber, which was a development of the SB) of the Air Force of the Baltic Fleet - the 1st mine-torpedo and 57th and 73rd bomber regiments of the Navy . However, the only result of these raids, stated their eyewitness, who then commanded the 56th motorized corps of the 4th Panzer Group E. von Manstein, was that the attacking aircraft were shot down!! . "The bombs were dropped with great dispersion and caused practically no harm," confirms the former pilot of the 54th Luftwaffe fighter squadron O.Kat, who participated in repelling these raids!?. The intact crossings made it possible to immediately transfer to the northern bank of the Dvina the motorized division of the SS "Totenkopf" - under the course of which Manstein was just waiting - and already on July 2, the 56th Corps resumed its rapid offensive across the Baltic ...

The crossing of the 24th motorized corps of the 2nd tank group near Bobruisk was also not successful. On June 29 alone, the Air Force of the Western Front carried out 59 SB sorties to destroy pontoon bridges across the Berezina, and on the 29th to bomb a concentration of tanks near Bobruisk!3. And on the 30th, SB, DB-3F and TB-3 of five air divisions - the 12th and 13th bomber

and the 47th mixed air force of the Western Front and the 42nd and 52nd bomber 3rd bomber corps DBA. Nevertheless, the crossing functioned on the night of the 30th and the 30th; On July 1, the 3rd Panzer Division of the 24th Corps was partially behind the Berezina and continued its offensive towards the Dnieper. The losses suffered by the 24th Corps for the entire period of June 22-30, 1941, were, according to the commander of the 2nd Panzer Group G. Guderian, "insignificant"!4.

Attacks on the Dvina and Berezina crossings turned out to be fruitless
- but the losses of the attackers were the same.

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For example, the air battles on June 30, 1941 in the area of Bobruisk were dubbed by the Germans as "air Sedan" (the name of the battle of 1870 has long become in Germany Sedan, the same thing happened as a year later near Bobruisk: German fighters and anti-aircraft gunners suffered colossal losses there against the British and French bombers, who were trying to disrupt the German crossing over the Meuse). According to Soviet data, on June 30, in the zone of the Western Front, the Soviet Air Force lost 82 aircraft for combat reasons (not counting those destroyed on the ground)¹⁵; without a doubt, the bulk of them were SB and DB-ZF, which on that day on the Western Front worked only along the Bobruisk crossing. Another 34 SB, DB-3 and DB-3F aircraft were killed that day during attacks on crossings near Dvinsk!¹⁶. Thus, on June 30, 1941, having achieved almost no success, Soviet bombers lost up to 110 aircraft in the Bobruisk and Dvinsk areas - almost two full-fledged five-squadron bomber regiments!

In general, the conclusion about the ineffectiveness of the actions of Soviet bombers in 1941 against the troops of the Wehrmacht, the Germans with good reason, is also supported by the argument that "the results achieved by the Soviet bomber aviation [...] were disproportionately small in comparison with the losses incurred"¹⁷. It was mentioned above about the successful bombing of German crossings across the Dnieper Kremenchug in early September 41st. But, an eyewitness of these strikes, a former pilot of the 17th Fighter Aviation Regiment of the Air Force of the Southwestern Front, F.F. Arkhipenko, admits, "it's scary to remember how many of our SB aircraft were lost, mainly from the fire of German anti-aircraft artillery" ... The 41st bomber air division of the Air Force of the Northern Front - the one that managed to beat up German tankers in the Pskov region - turned out to be knocked out in less than a month and a half: it joined the fighting in the first days of July, and already on August 12, only 3 -4 SBE. The 54th high-speed bomber regiment, which was part of the beginning of the war in

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the composition of the 8th mixed air division of the Air Force of the 11th Army of the North-Western Front: those of its SB that were not burned on June 22 at the airfield (and there were less than half of the 68 aircraft) almost completely died by July 14, i.e. . in three weeks of hostilities²⁰. And the 125th high-speed bomber aviation regiment of the 13th bomber air division of the Air Force of the Western Front lost almost all of its aircraft in just a week of fighting - by July (June 22 alone [the 3rd Division lost 64 of its 225 SBi Su-2 vehicles in sorties]²¹. The Germans report numerous cases of the complete extermination of entire groups of SBs; according to the memoirs of the former divisional commander of the 13th bomber regiment F.P. Polynin and the former pilot of its 24th high-speed bomber regiment V.A. m...

No less merciless were the beatings, according to Soviet data, to long-range frontline bombers performing missions. Thus, in the 3rd bomber corps of the DBA, out of 70 that flew out on June 22, 1941 to bomb the German troops of the DB-ZF, 22 did not return; about 30% of the losses were brought by sorties on June 23²². The 4th long-range bomber aviation regiment of this corps was destroyed in August-September 1941 in just five weeks; out of 73 of his DB-3s, 70 were killed²³. The Soviet side also recognizes the deaths of entire groups of long-range bombers. So, on June 24, 1941, the Messerschmitts shot down 8 out of 9 DB-ZF of the 212th long-range bomber aviation regiment of the 52nd bomber air division of the same 3rd corps of the DBA, which attacked German troops near Bereza-Kartuzskaya (between Brest and Baranovichi). On August 18, the same fate befell 5 DB-3 of the 231st regiment of the 50th division of the 4th bomber corps of the DBA, which bombed German columns in the area of Pyatikhatka (south of Kremenchug)²⁴.

In the same way, German experts assessed the results of Soviet bomber strikes in 1941 on objects located in the rear of the front: "In terms of the ratio of the efforts made and the damage inflicted, the effectiveness can be considered small"²⁵. Of the known exceptions

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only a strike by long-range bombers on the Vilno airfield at the end of June, as a result of which, according to German data, almost the entire materiel of the P group of the 27th Luftwaffe fighter squadron (i.e., about 30 VNO9E) was destroyed and the bombing on August 3, 18 DB -3, 18 SBib6 Pe-2 of the port of Constanta - when, at the cost of losing only three vehicles, it was possible to burn down five oil tanks, warehouses, workshops, destroy a German anti-aircraft battery and disable the port's freight station for several days²⁵. For the destruction of June 24, 1941 at the airfield. Mamaya near Constant-

tsy three VLO9E from the III group of the 52nd fighter squadron DB-3ZF of the 2nd mine-torpedo and SB of the 40th high-speed bomber aviation regiment of the Black Sea Fleet Air Force paid, according to Soviet data, 10 out of 34 DB-ZF and SB that flew to the Constanta area (i.e., only 3,4 sorties accounted for one irretrievable loss!). The DB-3 strike of the 2nd Mine and Torpedo Regiment on Constanta on June 25 only led to the enemy shooting down 4 out of 11 vehicles (about 2.8 per flight for one irretrievable combat loss!), And the loss on June 26 of 7 out of 17 bombed Bucharest, Ploiesti and Constanta of the aircraft of the 21st long-range bomber air regiment of the 22nd bomber air division of the 4th bomber air corps of the DBA (about 2.4 sorties per irretrievable loss!) was compensated only by exerting a psychological impact on the population of the Romanian capital...²⁷ Destruction three and the damage of several more German aircraft at the Pskov airfield on one of the July days of the 41st was accompanied, according to an eyewitness, by the former pilot of the 1st bomber squadron of the Luftwaffe M. von Kossart, the death of all those participating in the SB flight. Almost entirely, claimed an eyewitness of another raid, a former officer of the 30th bomber squadron H. von Reisen, nine SBs were also shot down, attacking the Banak airfield in Northern Norway in the same month - and it did not cause any damage at all: "most of the bombs fell outside the airfield"...

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squadron G. Pabst, "the losses of the Germans and the destruction of the airfield were small", but the bombing triples and nines "in most cases" were completely destroyed by anti-aircraft guns and Messerschmitts? Of course, the German figures for Soviet losses cannot be trusted. But, by analogy with the "air Sedan", in which the ratio of the number of actual German victories (82) to the number of declared ones (116-119) was 0.7, as well as with the battles of the same day in the Dvinsk region, where it was 0.5 (34 actual victories against at least 65 claimed)²⁹, it can be assumed that from half to two thirds of the bombers in all the above cases were actually shot down.

On average, the Red Army Air Force in 1941 irretrievably lost one bomber in 14 sorties (moreover, SB, DB-3Z and DB-3F - a much smaller number of them, since for one irretrievable combat loss of the Su-2 then there were about 22 combat departures)³⁹. In other words, the level of combat losses of Soviet daytime front-line bombers was then an order of magnitude higher than that of the German ones (about 120-200 sorties per irretrievable loss; see chapter UG), which, moreover, bombed (see chapter UG) incomparably more efficient...

So, the low effectiveness of the operations of the SB, DB-3 and DB-3ZF daytime front-line bombers is the reason for this:

- a) the low effectiveness of their bombing strikes and
- 6) excessive losses that did not correspond to the achieved results.

2. WHY SB, DB-ZI DB-ZF BOMBED UNSUCCESSFULLY?

As for the reasons for the low effectiveness of bombing strikes, the main one was the low accuracy of bombing noted by the Germans (see above). It, in turn, largely stemmed from the imperfection of the material part of the SB, DB-Zi DB-3ZF aircraft - and, above all, from the poor quality of their bomb sights.

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As noted back in April 1940, after the Finnish campaign, the brigade commander G.P. Kravchenko, "the sight is not suitable for the SB; SB is bombing badly."³¹ In the same campaign, the low efficiency of the OPB-2M sight, which had been installed since 1939 on the DB-3, was also revealed; it must be assumed that its predecessor OPB-2 was no better. The OPB-1M, which was equipped with the DB-3F, also turned out to be imperfect. Even before the war, training bombing from Su-2 aircraft showed that this sight only allows effective bombing from a height of no more than 3000 m, and the working height of bombing in general should not exceed 1000-1200 m. However, at altitudes of the order of 400 m, from which DB-3ZF bombed German tank and motorized columns in June 41, OPB-1M was also useless!³²

The DB-ZF aircraft was also prevented from placing bombs exactly on target by its instability in flight, especially longitudinal - due to the excessively rear centering of this machine. This plane, A.I. Molodchiy, who fought on it in the 748th distant non-bomber air regiment, noted, "every second strives to fall into a roll, go off course, turn up or lower its nose. You have to keep turning the wheel."³³ It is clear that if it is difficult to keep the aircraft on a combat course, then it is difficult for the navigator to aim ... The stability of the SB and DB-3 was better, but still not the same as that of the German bombers Junkers L188, Dornier Oo215 and "Heinkel He 111". Having familiarized themselves with L188 and Oo215 in 1940, Soviet specialists noted that these machines "drastically differ from domestic ones in their large stability reserves, which [...] simplifies the technique of piloting and mastering low-skilled combatant pilots"-4.

The low qualification of pilots and navigators was another factor that caused the low accuracy of the SB, DB-3 and DB-3ZF bombing in 1941. A significant part

The SB pilots were young people who graduated in 1940 and did not receive sufficient flying practice either at school or in a combat regiment. This was hampered by the shortage of gasoline in the hypertrophied Soviet Air Force (as of September 1, 1940, for example, school security services were provided with fuel for only 41.4% of the need), and in the combat units of the Kyiv and

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The Western Special Military Districts also had a stormy winter, full of non-flying days, which stood in the 41st in Ukraine and Belarus. "Independent release on combat aircraft of young flight personnel was unacceptably delayed," stated in the directive of People's Commissar of Defense S.K. Timoshenko dated May 7, 1941, "and was not completed by the end of the winter period" of training. The aircrew "trained themselves completely unsatisfactorily" in bombing; Thus, in the Air Force of the Kyiv Special Military District in the winter period, one crew had less than one bombing flight! "Not intensively", in particular, the training of SB crews in the most accurate method of bombing - from a dive³⁶ was carried out (however, there would be little sense from this training in any case. without bombs at angles close to 90°, while with bombs even a specially modified SB could not withstand such a steep dive due to insufficient safety margins). The leaders of the groups that attacked on June 30, 1941, the crossing over the Western Dvina near Livani, were clearly experienced pilots and commanders - they attacked the targets of the group from the flanks, sometimes even from the rear (so that the strikes turned out to be sudden). But the bulk of the pilots clearly lacked skills and experience, and the effectiveness of the strikes themselves turned out to be, as already noted, very low...

The low proficiency of the majority of the crews allowed them to operate only "as part of a flight at the signal and example of the leader", i.e. the pilots could only repeat all the maneuvers of the aircraft of the leading group, and the navigators, instead of aiming independently, could look at the aircraft of the leader and drop bombs immediately after he did so. (True, bombing "on the leader" was then considered the norm; "navigators were not taught to bomb on their own, but to hit the leader" even before the Finnish war³⁷; one way or another, such bombing could not differ in accuracy in principle.) It is possible that it was precisely the low training of most crews (rather than their own negligence) prompted many leading security groups not to waste time on

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flight training - and not even to inform the pilots about the nature and location of the target (!) - to demand only a blind repetition of all their actions on the route and over

purpose. In this case, the death of the leader at once disrupted the fulfillment of the combat mission - after all, even he often had the map with the route laid out alone!

With the low training of most crews (and their lack of combat experience), the cases of manifestation of "indecisiveness and nervousness when colliding with the enemy's defenses over the target" that the Germans repeatedly noted were also natural. And it also "resulted in premature or inaccurate bombings"³⁸. Let us note that, on the whole, the Germans assessed the behavior of the crews of Soviet bombers of 1941 as courageous³⁹; thanks to him, the aircraft under fire often nevertheless reached the target, but when delivering the actual strike, the lack of training and experience still outweighed, and prompted them to drop bombs quickly ... Sometimes, said General of the Luftwaffe K. Webe, anti-aircraft defense and adverse meteorological conditions on the route prompted the crews of the Soviet bombers to completely stop the performance of the combat mission⁴⁰; Undoubtedly, the lack of confidence of poorly trained pilots in their POSSIBILITIES also affected here.

Along with the low accuracy of bombing, the effectiveness of the SB, DB-3 and DB-3F strikes reduced the weakness of their bomb salvo. The normal bomb load of relatively small SB machines was only 500-600 kg (against 2000-3000 kg of German aircraft of the same purpose - L188 and He1 11), and in overload, using an external suspension, SB with engines M-103, M- 104 and M-195 could take up to 1600 kg⁴¹. However, in the units there were also many vehicles of early modifications - with M-100 and M-100A engines ... The Ilyushin bombers also fell short of the performance of their German counterparts, the normal bomb load of which was 1000 kg, and the maximum reached 2500 kg, theoretically (DB- 3, for example, he could only lift more than two tons of bombs in winter - otherwise the overloaded engines would overheat)"⁴². A real load

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DB-3 and DB-3F in 41 were often surprisingly low for cars of this class. So, on June 30, 1941, DB-3 and DB-ZF of the 1st mine-torpedo aviation regiment of the 8th bomber air brigade of the Air Force of the Baltic Fleet, having completed 32 sorties in the Dvinsk region, used up 30 FAB-100 bombs and 269 FAB- 50; consequently, the average bomb load of one aircraft in these sorties was only 514 kg. each bomber carried only 800 kg of bombs. Note that the airfields of the Leningrad Region, from which the vehicles of the 8th brigade started, were only about 450-480 km away from Dvinsk - while the DB-3ZF of the release of 1940-1941. 1000 kg of bombs could cover about 3000 km⁴⁴. If the naval DB-3 engines could already wear out, then the recently received DB-3F -

hardly...

3. WHY DID SB, DB-3 AND DB-3ZF HAVE HUGE LOSSES DURING THE DAY?

We will also begin the analysis of the reasons for the excessive losses of the SB and the DB-3 and DB-ZF operating as day front bombers with their materiel.

As for the SB, in the domestic literature, first of all, the low-speedness of these machines was emphasized, which made them allegedly defenseless before the Messerschmitts. Indeed, the maximum speed of 393-450 km/h (depending on the type of engines, hoods and radiators)⁴ was already insufficient for 1941, but the German He1 11H, which then developed only 410-430 km/h⁴⁶ - the same like most of the SB, they did not suffer such huge losses as the Tupolev cars. At the same time, the newest Soviet Pe-2s, with their 530 km / h in the summer of 41, were exterminated by "Messers" at the same pace as the SB ... It is characteristic that the German aviators - participants in the 1941 campaign - by no means considered insufficient speed not the wealth of the SB⁷. Much more important was how

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put, the weakness of the defensive armament of this bomber.

To begin with, the destructive effect of the 7.62-mm ShKAS machine guns (with a bullet weighing only 9.6 and a guiding energy of only 329 kgm) was very insignificant; cases were often noted when a German fighter continued to attack even after the ShKAS burst hit its engine! In addition, already at distances of 100-150 m, the ShKAS gave great dispersion - and after all, the German fighter pilots conducted effective cannon fire from the big ones. Yes, and there were only four such machine guns on the Security Council, and they were not placed very well, and the design of the installations was not satisfactory. Half of all barrels (paired installation of the navigator) protected the least dangerous sector - the front hemisphere - and even then only relatively. After all, this nose twin - which went up and down the slots in the glazed nose of the fuselage - had very small angles of fire along the horizon. The upper ShKAS, from which, covering the aircraft from behind - from above, the gunners fired, only on a small part of the SB was installed on a very good MV-3 turret. Most of the machines had a Tur-9 turret, which, unlike the MV-3, was not shielded by a transparent cap in combat position - so that the gunner fired, leaning out into the air stream along with the machine gun. And at speeds of 300-400 km / h, the air pressure was so strong that, for example, it was almost impossible to deploy the ShKAS perpendicular to the flight direction, and even if it was possible to do this, it was still possible to shoot

it is impossible: from the pressure of air, the machine gun bolt jammed. In addition, the "drowning" of the Tur-9 turret into the fuselage caused the presence of "dead cones", i.e. inaccessible spaces. "In reality, the sector of fire did not exceed plus or minus 20 °"...49 The fourth, lower ShKAS, which protected the bomber from the rear from below, was mounted on most SBs in a pivot hatch installation LU, which also had very limited angles of fire and did not provide the gunner with a good view. On a small number of vehicles, instead of the LU, there was a more effective MV-2 turret, which made it possible to increase the number of hits by 2-3

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times - however, it was also equipped with a "blind" sight OP-2L - with a field of view of only 15-20 °. The shooter clinging to this sight, after several maneuvers of his own or the attacking aircraft, lost his spatial orientation and had no idea where the Messerschmitt 0, which had disappeared from his field of vision, would jump out the next moment.

Finally, from the upper and lower machine guns on the SB (unlike German vehicles) it was impossible to fire at the same time: they were served by one shooter. The significance of this circumstance can be judged from the memoirs of N.E. Western Front. According to his firm conviction, the last of the 72 SBs that were available in both regiments at the beginning of the war survived all the others only because "a second air gunner was added to the crew in the lower hatch with a Berezin machine gun" ... 51

Thus, fighters attacking from the most dangerous, rear hemisphere, the SB (and even then not always) could meet with fire from only one machine gun, while the equally slow No! 11N-4, N-5 and N-6 (the most common modifications of the "Heinkel" in 1941) - with two or four fire, which also covered a much larger area? At the same time, the lower gunner of the German aircraft, located in the ventral gondola with advanced glazing, had a much better view ...

The Germans, however, considered the "main weakness" of the SB to be its "flammability", due to the absence of a protector in gas tanks that tightened holes (since 1937, protected tanks were installed on some series of machines, but they were not widely used), as well as the lack of internal sealing of the airframe. Gasoline vapors from punctured tanks instantly spread throughout the aircraft and immediately flared up from the next machine-gun or cannon burst. The enemy also emphasized the ease with which the SB engines ignited, above which the expendable fuel tanks were located⁷³. However, both the Finnish war and the 41st year showed that nothing

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it was no more difficult to set fire to the engines of Ilyushin's bombers. Suffice it to recall the famous air battle on January 6, 1940, in which the Finnish pilot J. Sarvanto, firing at the engines, shot down six DB-3s from the 6th long-range bomber aviation regiment. Or turn to the memoirs of G. Rall, who fought in 1941 in the Shgroup of the 52nd Luftwaffe Fighter Squadron. "I caught sight of the right engine of one of the bombers," Rall describes his fight with DB-ZF near Constanta in June 1941, "and pulled the trigger. The plane was engulfed in flames, and it began to fall, going into a tailspin.

However, according to German experts, DB-3 and DB-3ZF were more difficult to shoot down than SB. First, Ilyushin's cars were equipped with sealed gas tanks. True, on the DB-3 this did not save from a fire when incendiary bullets hit, because the tanks were not equipped with a system for filling them with neutral gas as the fuel ran out, preventing the formation of flammable gasoline vapors. However, the DB-3F also had such a system. Secondly, the Germans pointed out, "in general, the design of these aircraft was more durable and therefore less vulnerable to small arms"56.

The defensive armament of long-range bombers was also somewhat more effective than on the SB. True, in 1941 they were equipped with the same low-power ShKASs (and not even four, at the bow installation was not paired); the layout of the rifle installations was the same: bow, upper (middle) and lower (hatch). It is also true that the bow mount not only had fewer barrels than on the SB, but was just as (or even more) inconvenient to maintain. On the DB-3 (where it was a Tur-8 screened turret) it was impossible to fire from it at high speeds: the oncoming air flow rushing into the open screen flap literally tore the navigator off the seat. And on the DB-ZF, the OPB-1M bombsight interfered with firing from the bow ShKass (mounted, as on He 11, in a ball installation) ... However, the upper and lower installations, which are more important in air combat, were more effective than on most SBs. On a significant

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In the main part of the DB-3 and DB-3ZF, the MV-3 and MV-2 turrets described above were located here. Sometimes, instead of the MV-3, there was a SU (5T211) installation that did not have aerodynamic compensation (and therefore deployed with great difficulty) with a Tur-8 turret, and instead of the MV-2, the same semi-useless pivot installation LU (5T231), as on the larger part of the SB (part of the DB-ZF aircraft was equipped with the ULU installation). No SU (5T211) was more effective than the Tur-9, which stood on most of the SB: towering over the fu-

green, it had larger firing angles along the horizon and was shielded during firing. In addition, the crews of the DB-3 and DB-3ZF in 1941 often had a second gunner, so that it was possible to fire from the upper and lower installations simultaneously.

But still, the defensive armament of the Ilyushin bombers did not meet the requirements of the war? 422-435 km / h DB-3Fz®) German fighters He! 111N-4, N-5 and N-6. And the remark about the greater survivability of the DB-3 and DB-ZF airframe compared to the SB is, in general, purely academic in nature: in real battles, long-range bombers suffered, as we saw, just as heavy losses as the SB. Another unfavorable factor for the Soviet side came into play here - the high combat skill of the German fighter pilots of 1941 (the He! 11 crews were in a much more advantageous position here!). The glider of the Ilyushin machines was quite tenacious - but the pilots of the Messerschmitts hit the engines ...

And, finally, the illiterate tactics used by the Soviet bomber aviation in 1941 led to huge losses of the Security Council and the DB-3 and DB-3F day front bombers.

Some of its flaws were due to the mistakes of the aviation (and sometimes combined arms) command. So, in the first few weeks of the war, SB, DB-3 and DB-3ZF flew without fighter cover - although there were significantly more fighters in the army then than in

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the following months ... Thus, the bombers, which had weak defensive weapons, were doomed to become easy prey for German fighters - and the command also aggravated this mistake by another one, which consisted in the fact that the bombers were released on combat missions in small groups. Most often they consisted of 6-9 aircraft (i.e., two or three links), and it happened that only 2-4! Such small groups could not compensate for the weakness of the defensive armament of their vehicles by concentrating the fire of several bombers on the attacking "Messerschmitt": the density of such fire turned out to be too low ... To a large extent,

Therefore, the mass death of red-star bombers over Dvinsk on June 27-30, 1941, and the "air Sedan" over Bobruisk on June 30 should be attributed to the Soviet command. After all, SB, DB-3 and DB-3ZF approached the crossings across the Western Dvina and Berezina in those days in separate squadrons and even units! Similar tragedies took place in those days in the Ukraine; Thus, G. Pabst, mentioned above, described an episode when "Soviet bombers attacked areas of the

completion of German troops in small groups of 2-4 aircraft. Not one of them got away from the German exterminators. Pabst speaks of these operations as ill-conceived and primitive by German standards"°.

For the SB, DB-3 and DB-3ZF, the strikes they practiced on tank and motorized columns from a height of only 100-400 m turned out to be truly disastrous. June 1941, the People's Commissar of Defense S.K. Timoshenko himself; in other compounds, "pilots [apparently still leading groups. - A.S.] themselves tried to attack from low heights"60: they hoped to compensate for the imperfection of the bomb sights and the poor training of the crews. But at low altitudes, twin-engine bombers were too big a target not to suffer huge losses from small-caliber anti-aircraft guns, the saturation of which was very high among the ground forces of the Wehrmacht. Not by chance, for example, the 2nd is mixed

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In just six days of operations from low altitudes against the columns of the 4th Panzer Group of the Wehrmacht in the Pskov region in early July 1941, the 1st and 41st bomber air divisions of the Air Force of the Northern Front lost 60 aircraft (mainly SB), i.e. up to a quarter of its composition!. Of the seven SBs of the 450th high-speed bomber regiment of the Air Force of the Western Front, which bombed on October 7, 1941, from a height of 100-200 m, a motorized column on the Yukhnov-Spas Demensk highway, three were shot down by anti-aircraft guns ... 62

Other tactical flaws in Soviet bomber aviation in 1941 were due primarily to the poor training of the pilots. All German experts - participants in the 1941 campaign - noted the same feature of the actions of the SB, DB-3 and DB-3ZF: "having come under anti-aircraft fire, the group stubbornly moved forward without any attempts to evade"63. We note that on the eve of the war the units were familiar with the very concept of "anti-aircraft maneuver"; for example, in the 202nd high-speed bomber regiment of the Air Force of the Leningrad Military District, even young pilots heard about it64. Therefore, the rejection of the anti-aircraft maneuver can only indicate the low level of flying skills of most pilots. The pilots (or the leaders of the groups who decided for them) were clearly afraid that, having started to maneuver, they would break away from the group and would not be able to reach the target, or even lose their bearings ... One way or another, for numerous rapid-fire 20- and 37-mm anti-aircraft guns sailing in close formation and not resorting to anti-aircraft maneuver SB, DB-3 and DB-3F were just an ideal target!

One should not be surprised at the entry in the combat log of the 51st fighter squadron of the Luftwaffe, according to which the Soviet bombers, operating in June 1941 in Belarus, "did not make any

shield maneuvers when German fighters swooped down on them"^{6>}. In conditions where most of the pilots were inexperienced, the rejection of the anti-fighter maneuver was inevitable.

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4. ABOUT THE COMBAT WORK OF THE SU-2 SHORT BOMBER

A prominent place in the operations of the Soviet daytime front-line bomber aviation in 1941 belonged (especially on the southern wing of the Soviet-German front) to the Su-2 single-engine short-range bomber, created under the leadership of P.O. Sukhoi. Local successes were sometimes achieved by these machines as well; so, the Germans admit that on August 30, 1941, the Su-2 (227th near non-bomber air regiment of the 62nd bomber air division of the Air Force of the Southwestern Front) destroyed 10 ¹⁰⁹ groups of the 3rd Luftwaffe fighter squadron at the Belaya Tserkov airfield. A few others under repair were burned along with the building of the repair shops⁶⁶. However, in general, N.T. Gordyukov and D.B. Khazanov note that the combat work of P.O. Sukhoi's machines did not impress the enemy. Apparently, there were many more ineffective strikes than highly effective ones. The same low qualifications of the majority of the crews, aggravated by the novelty of the Su-2 aircraft, which began to enter almost all the regiments that fought on it only in 1941, had an effect. front of F.A. Astakhov, the 226th and 227th short-range non-bomber air regiments of the 62nd bomber air division, which nevertheless had to strike at the motorized columns in late June - early July 41. At the same time, bombing in the 227th regiment was carried out "according to the leader" ... The researchers are inclined to explain the ineffectiveness of the bombing of the crossings across the Prut on June 25, 1941, carried out by six of the 211th short-range bomber regiment of the 20th of the mixed air division of the Air Force of the Southern Front ("all the bombs fell with a large flight and did not cause harm to the enemy")⁶⁸. The small bomb load of the Su-2, the normal value of which was only 400 kg, and the maximum - 600 kg, did not contribute to the effectiveness of the strikes⁶⁹. In practice, they also loaded

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less. So, on July 9, 1941, the 62nd bomber air division of the Air Force of the Southwestern Front, having completed 85 sorties, dropped 28.2 tons of bombs", i.e. the average "bomb charge" of one aircraft was only 331.8 kg. And this despite the fact that not only the Su-2 flew out (from the 226th and 227th

non-bomber air regiments), but also more heavy-lift SBi Pe-2 (from the 52nd and 94th). This means that the Su-2 in these years took on board even less than 300 kg of bombs! And the 43rd bomber air regiment from August 1941 to March 1942 dropped 379,850 kg of bombs in 2,377 sorties⁷¹; consequently, the average bomb load of his Su-2 was only 160 kg!

And in any case, the successes of the Su-2 did not pay off - like two motor bombers - their huge losses. July 21-24, 1941 The 211th short-range bomber regiment of the 20th mixed division (by that time transferred to the Air Force of the Southwestern Front) managed to achieve direct hits on the crossing across the Dniester near Yampol and on a cluster of vehicles and guns near it - but paid for this 30th Su-2, i.e. half of the staff! The 103rd and 135th melee non-bomber air regiments of the Air Force of the 21st Army of the Western Front, operating in late June - early July in Belarus, did not achieve any noticeable success - but lost 24 Su-2 from 81 (i.e. 30%), and almost all the remaining vehicles were damaged. And the 97th regiment of the 13th bomber air division of the Air Force of the Western Front lost almost all of its 50 Su-272s in two weeks (from June 22 to July 7, 1941).

The reasons for these exorbitant losses were, in general, the same as in parts of twin-engine bombers. However, it seems that the imperfection of the material part played a less significant role here.

The defensive armament of the Su-2 was, of course, weak. It consisted, as a rule, of only one ShKAS, firing up and down, and on many vehicles it was mounted not on a good shielded MV-5 turret, but on TSS-1 - which had insufficient angles of fire, did not protect the navigator firing from the stream air and required time to put forward the pu

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leMET from marching to combat position. In July 1941, in the navigator's cockpit, they also began to mount a lower rifle installation - ShKAS on the MV-2 turret. However, the firing angles of the lower machine gun were insufficient; due to the absence of a third crew member, simultaneous firing from both ShKASs was also impossible ... But, on the other hand, the small, highly maneuverable and relatively fast (460 km / h⁷³) Su-2 was more difficult for the enemy to catch in sight than bulky twin-engine SB, DB-3Zi DB-3ZF. Sukhoi's plane could easily dodge the Bf109 attack by laying a sharp turn, which the Messerschmitt, with its much larger turn radius, could not repeat. This technique was brilliantly demonstrated in 1941, for example, by Lieutenant I.F. Malysenko from the 103rd short-range bomber aviation regiment and senior lieutenant S.I.

However, the bulk of the Su-2 pilots, apparently, were not prepared for this maneuver, which was accompanied by large overloads and required good training - it was no coincidence that the Sukhoi aircraft seemed "low maneuverable" to the Germans! 74 Soviet pilots did not even use the "defensive circle", which more than once saved the German L187V - the same single-engine two-seater vehicles as the Su-2, with the same defensive armament and a much lower (only 340 km / h) maximum speed ...

The survivability of the Su-2 was also very good. So, M.A. Lashin, who fought in the 135th short-range bomber aviation regiment, noted that this "incredibly tenacious" aircraft caught fire "for a long time and hard", "never flashed a torch" / 5 - especially since it had protected gas tanks. The same is evidenced by the memories of the former pilot of the headquarters detachment of the 53rd fighter squadron of the Luftwaffe F. Shisa, who on July 8, 1941, from a distance of only 50 m, hit the Su 2 from all the trunks of his BOO9E until the ammunition was completely used up. The Germans managed to hit the navigator, the landing gear fell out of the damaged bomber - but the Su-2 did not catch fire and in the end was able to escape ... However, the skill of the bulk of the German pilots destroyed

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judging by the losses of the Su-2, it turned out to be enough to neutralize this dignity of the bomber P.O. Sukhoi. Undoubtedly, the same high density of fire of the German anti-aircraft artillery also had an effect ...

5. HOW EFFICIENT DID THE PE-2 AND BOSTON BOMBERS PERFORM?

In late 1941 - early 1942, the last SB and DB-3 remaining in the Air Force of the active army (the production of these types of machines was discontinued in 1941), as well as DB-3ZF, were transferred to operations at night. At the same time, they stopped producing the Su-2; in 1942, the number of vehicles of this type in the front-line units did not exceed a few dozen. Around the spring of 1942, the Pe-2 twin-engine dive bomber designed under the leadership of V.M. Petlyakov became the main daylight bomber of the Soviet Air Force. From May 1942, the "pawn" began to be supplemented by the "Boston" - this is how, following the example of the British, the American twin-engine bomber Douglas A-20 supplied by the allies was called in the USSR. By the spring of 1943, of all the Pe-2s and Bostons available at the front, American vehicles made up at least a third, and during 1944 about a quarter?

However, even on this new materiel, the successes of the Soviet daytime front-line bomber aviation turned out to be quite modest. True, German experts unanimously confirm that its effectiveness has been constantly increasing, but the growth was not very impressive. Assessing the effectiveness of the main work of Soviet front-line bombers - attacks on troops and other objects located in tactical depth - V. Shva Bedissen stated that back in 1942-1943. "German losses from such bombardments, with the exception of the battle of Stalingrad, were quite low" and that "non-German troops did not experience any special problems with them, that

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which, for example, as from the actions of attack aircraft. (But this last one, as we have seen, exhausted the enemy more than destroyed his manpower and equipment!) Even if the strikes were successful, "the results did not correspond to the efforts expended"". One of the German officers whose assessments (along with the assessments of staff reports) were summarized by Schwabedissen, fought in the 27th bomber squadron of H.-H. Baron von Beust - directly believed that in 1942-1943. Soviet bomber aviation "remained relatively weak and ineffective"...⁷⁸ In 1944-1945, German experts admit, it "increased in many ways"; "continuous massive bombing attacks in the German front line in the area of the main attack during the offensive and breaking through the defenses played an important role in the successful completion of the operation"?. Nevertheless, summing up, Schwabedissen noted that these blows "did not acquire decisive significance"; elsewhere, a German analyst concluded that "the results of the activity of the Soviet bomber aviation turned out to be limited" ... ⁸⁰

6. WHY DIVE-BOMBERS PE-2 RARELY DIVE-BOMBED?

The rather modest assessment of the effectiveness of Soviet front-line bomber aviation in 1942-1945, given by the Germans, is all the more interesting because the main Soviet day bomber of this period, the Pe-2, seemed to make it possible to achieve much more. After all, this aircraft was not only much faster and better armed than the SB, but it could also bomb from a steep dive at an angle of 60-90°. And this made it possible to achieve an incomparably greater accuracy of bombing: the greater the angle of the aircraft's dive on the target, the more the trajectory of the dropped bomb coincides with the line of sight. In the 284th bomber regiment in 1943, when bombing from level flight, the average deviation of the dropped bombs from the target was more than 200 m, and

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when bombing from a dive - only 18 m1. Pikiro shaft Pe-2 steadily, not scouring the course; the input and output of the aircraft from the dive was provided by an automatic machine; brake grids installed under the wing reduced the speed of the aircraft accelerating on a dive - and thereby facilitated aiming.

However, this main advantage of the Pe-2 - the ability to dramatically increase the accuracy of a bombing strike - was not used by the bulk of front-line pilots during most of the war! Until the end of 1943 (!) "pawns", as a rule, bombed from level flight; dive bombing was rarely used. So, from the beginning of 1942, this last method began to be used in the 9th short-range bomber aviation regiment of the Air Force of the Western Front, from the summer of the 42nd - in the 150th bomber aviation regiment of the special air group No. 1 of the 8th air army of the Stalingrad Front, from the end of 42 1st - in the 301st bomber air division of the same army, in January 43rd - in the 1st bomber air corps of the 3rd air army of the Kalinin Front, headed by the former commander of the 150th regiment and 301st division I.S. Polbin. However, in other units and formations with the Pe-2, they even removed them at that time - as unnecessary! - diving machines and brake grids; according to V.B. Shavrova, the "pawns" of some series came out without grilles already from the factory ... 8? "Dive-bombing is rarely used," it was stated in the directive of the commander of the Red Army Air Force A.A. Novikov dated July 7, 1943, summing up the work of Soviet aviation in March - June 43rd⁸³. And even after the Battle of Kursk, on September 2, 1943, Novikov had to summarize that dive strikes were used "insufficiently and not confidently" (in the corps of I.S. - A.S.) - and put before the aviation commanders for the dacha to train dive bombing at least one regiment in each division equipped with Pe-21 by October! one regiment per corps (and not a division)—the 128th bomber regiment. And in the 1st, Polbinsky,

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corps in October and November, dive strikes were delivered only in about half of the sorties.

What was the explanation for this stubborn failure to use the possibilities of the "pawn"? Often, dive bombing was prevented by bad weather, or rather, low cloud cover. So, in November - December 1941, at the height of the battle for Moscow, the lower edge of the clouds in the Moscow region did not rise above 200 - 1000 m, it was impossible to dive on the Pe-2 at such a height: the pilot simply would not have had time to bring this rather inert car from peak. It was precisely because of the bad weather in the 4th bom-

In March 1945, the barrage air corps managed to carry out only about 2% of the bombings from a dive. In the 54th, 133rd, 603rd high-speed bomber air regiments of the Air Force of the Western Front, during the battle for Moscow, they also did not dive because they feared the failure of the unreliable mechanism for cleaning the brake grilles. Left unremoved after exiting the dive, they would continue to reduce the speed of the bomber in level flight - and this would make the Pe-2 "an easy prey for enemy anti-aircraft guns or fighters" 87. Former commander of the 9th melee non-bomber air regiment A.G. about the unwillingness of pilots to bomb from a dive, characteristic of the summer of 1942, also pointed to another reason - "the desire to secure their actions over the target." But, he added, "the main reason was something else: the flight crew, in their overwhelming majority, had not yet been properly trained in the art of dive bombing" ... 88

And indeed, the main reason for the refusal of the pilots of the "pawns" from diving from a dive must still be recognized as their poor training. When retraining pilots on the Pe-2 on the eve of the war, dive strikes were not practiced with them; in July 1941, they began to do this at the Lipetsk Aviation Training Center, but by October, to save time, the number of dive bombings that each crew was allowed to perform was again brought from 4-6 to zero; in 1942, during training in the reserve regiment, the young pilot managed to complete only one such bombing, and in 1943 - two. True, the marks received for these one or two bombings were not bad.

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In 1941, 32.4% of pilots had "excellent" here, "good" - 31.8%, "satisfactory" - 35.8%; in 1942, 29.0%, 30.0%, and 41.0%, respectively; in 1943 - 29.5%, 31.7% and 38.8%⁹⁰. But this is typical Soviet "inflated" reporting: in 1942 it was noted that the crews that arrived from the reserve regiments were not ready for individual dive bombing? bombing accuracy than what was achieved on paper in spare parts. If the last of those who bombed from a dive to "failed" were not, according to reports, with everything, then in the 1st Guards, 1st 3rd bomber air corps in July - December 1943, there were "losers" from 14 to 50%, and there were not about a third of excellent students, but from 0 to 11% (or only in the 1st bomber in September - October - 38%)³².

It was very difficult to train pilots at the front: mastering a dive strike required considerable effort and time. The exit from the most effective dive from the point of view of bombing - at an angle of 90 ° - was accompanied by overloads that only specially trained pilots could withstand. Captain V.A.Gordilovsky from the 125th Air Force Bomber Aviation Regiment Leningrad-

On the front, an experienced, but not so well-trained pilot, in January 1942, while taking the Pe-2 out of a vertical dive, he lost consciousness and received damage to internal organs ... Therefore, the dive angle during training had to be increased gradually; It is no accident, for example, that in the autumn of 1941, in the 321st short-range bomber aviation regiment of the 77th mixed air division of the Air Force of the Western Front, they managed to master only a flat dive (at an angle of 30-40 °) - or only individual crews began to learn to dive at an angle of 60 °. In the memoirs of A.G. Fedorov and a veteran of the 202nd Bomber Aviation Regiment N.I. Gapeenko, it is especially emphasized what hard work the transition to bombing from a dive at an angle of 60 degrees or more required from front-line regiments; how long did it take to work out such strikes - first by separate crews, then by links,

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squadrons and, finally, the entire regiment? Not all front-line air units had the time and range conditions for this; certainly not for all front-line commanders - who were primarily responsible for combat work! — there were forces and a desire to organize these trainings, especially since even in 1942, the corresponding methodological developments were not available everywhere. "They ordered us to bomb from a dive," recalls, for example, I.I. Kabakov, who then fought in the 73rd bomber regiment of the Air Force of the Baltic Fleet, "but the theory of dive was absent" ... 94

It should also be taken into account that the Pe-2, unlike, for example, the SBiL88, was very difficult to pilot. The commission, which at the beginning of the war studied the experience of operating "pawns" in the 58th high-speed bomber aviation regiment of the 2nd mixed air division of the Air Force of the Northern Front, noted that, According to the "general opinion of the flight personnel", "the machine is too complicated in piloting technique, especially on takeoff and landing. The operation of an aircraft requires pilots above average qualification, which is difficult for an ordinary pilot to master"5. "How many times," A.G. Fedorov recalled, "I had to watch how, at the beginning of the run, the "pawn" suddenly turned to the right, and the pilot, unable to parry the turn with the help of another motor, was forced to stop taking off. And what attention is required when landing! The slightest oversight leads to a series of such tall "Kozlov" that one involuntarily marvels as soon as the chassis is held up"96. Meanwhile, the total flight time on the Pe-2, with which the pilot arrived from the reserve aviation regiment to the front, in 1941 averaged only 6 (according to other sources - 7) hours, in 1942 - 12 (according to other sources - 13) , in 1943 - 15 ... 97 Therefore, when young replenishment was commissioned in front-line regiments, it was probably very often simply not up to mastering dive bombing - it would be necessary to work out the piloting technique ... In addition, an overly strict machine generally caused a "very wary attitude" towards oneself?8. And this also did not encourage attempts to take from

her best.

It was possible to improve the landing qualities of the "pawn" only in

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at the very end of 1944, when a variant with a modified wing tip profile? ° was launched into the series. And the overwhelming majority of the Pe-2s that fought remained, according to test pilot P.M. Stefanovsky, "difficult and inconvenient for the crew"!09 machines.

As a result, even in one of the two divisions of the Polbinsk | -th bomber air corps - the 1st Guards Bomber Air Corps - in July 1943 only 16% of the pilots could dive bomb - and only by August this percentage was brought to 40 in the corps, and in October - up to about 70 (but the percentage of those who know how to bomb in groups is only up to 57-58). On October 20, 1943, out of 67 corps crews bombing the railway stations of Alexandria, Koristovka and Verkhovtsevo (between Kremenchug and Dnepropetrovsk), only 25 of the most trained were allowed to inflict dive strikes!01.

7. WHAT ELSE DECREASED THE EFFICIENCY OF THE PE-2?

Insufficient bombing accuracy

Insufficient training of Pe-2 pilots (exacerbated by the complexity of this aircraft in piloting) also affected the accuracy of dive bombing, especially in 1941-1943. It is unlikely, for example, by chance that during the battle for Moscow, in November-December 1941, the accuracy of the bombing strikes delivered by the "pawns" of the Air Force of the Western Front from a dive at an angle of 60-65 ° turned out to be only twice as high, than during bombing from level flight!02, although, as we have seen, here it was possible to achieve a 19-fold increase in the accuracy of orders ... It is also characteristic that, during 1943, diving on enemy ships and vessels, Pe -2 of the 40th aviation regiment of dive bombers of the Black Sea Fleet Air Force achieved only one and a half times more hits than the Boston bombers bombing from level flight (and equipped with mediocre Soviet sights, moreover) ...!03

In fact, the diving Pe-2 sat so "tight" in the air stream that it was very difficult for a poorly trained pilot to turn the plane on course in order to correct the aiming error. In addition, ceteris paribus, an inexperienced pilot dropped bombs from a greater height than an experienced one - and therefore they fall

or with a large deviation from the goal. The fact is that it was more difficult for a pilot who had little control over the car to get it out of the dive - the ion began to do it as soon as possible ... Due to the too high dive speed (up to 680 km / h even with the brake bars released), the Pe-2 went out of the peak quite slowly, making a significant "drawdown"!04. In 1941-1942. it was believed that when diving from a height of 2000 m, this "drawdown" (i.e., the loss of altitude in the process of bringing the car into level flight) is 900 m, and therefore it is necessary to drop bombs and start the withdrawal already at 1000-1200 meters!05 . Experienced pilots could do this later; for example, the nine of Captain P.A. Deltsov from the 24th bomber aviation regiment of the 241st bomber air division of the 16th air army of the 1st Belorussian Front, entering on June 28, 1944, during the Bobruisk operation, into a steep dive to the crossing through Berezina at an altitude of 2000 m, managed to drop bombs from less than 900 meters. And the pilots of the 9th short-range bomber regiment of the Air Force of the Western Front during the battle for Moscow, diving - and, moreover, "almost vertically"! - from a height of 1500 m, they managed to bomb at a 400-meter mark! 106 7

However, experienced pilots in the Soviet Air Force during the war years were not common. Thus, by August 20, 1944, in the 13th air division of dive bombers of the Air Force of the Black Sea Fleet, 30-40% of the flight personnel were yesterday's cadets, and one of its two parts - the 29th air regiment of dive bombers - had never bombed from a pi As a result, diving on August 21 in the area of Cape Tuzla on the Romanian destroyer "Regina Maria", the pilots of this and another regiment of the 13th division (40th) dropped bombs not only from 1300 meters, but from 2500 -meter HEIGHT. And on August 20, striking at the ships in Constant

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tse, the "pawns" of the 29th regiment bombed from 2100 m (starting dives from 3000), and the planes of the 40th - from 2800 at all (entering the peak at 4000 m)! From 1300 m, then only a "group of snipers" of the 40th regiment was bombed ... (For comparison: in the Polbinsk air corps - then already called the 2nd Guards Bomber - in the same summer of the 44th, the bomb release button when diving from a height of 3000-4000 m, they pressed only on the 1000-1500-meter.) It is not surprising that neither the "Regina Maria" nor the objects of aimed strikes on August 20 - the Romanian destroyers "Meresti" and "Mereshesti" - did not receive a single direct hit!08.

Of course, in 1941-1943. Pe-2s were also shown samples of high-precision work - but in these cases, experienced pilots sat at the controls of the dive bombers. Having attacked Ploiesti on July 13, 1941, 6 "pawns" from the same 40th bomber regiment of the Air Force of the Black Sea Fleet destroyed two factory buildings, destroyed 202 tanks with oil products, 46 oil tanks, two warehouses, burned a total

about 220,000 tons of oil products and put the Romanian oil refineries "Orion" and "Astra-Romania" out of action for a long time!⁹ The new 41st Naval Aviation was generally distinguished by a well-trained flight crew, and for this strike they also selected the most qualified, with combat experience, pilots ... There is also an episode with the destruction of just two "pawns" of a fuel and lubricants depot near the Don farm Morozovsky in August 1942. But these were the vehicles of the 150th Bomber Aviation Regiment, whose pilots mastered dive bombing well thanks to the hard work of their commander, the famous innovator tactician I.S. Polbin. And he himself drove one of the cars - "an outstanding Soviet ace", "a master of sniper bombing"!¹⁰ The destruction of the strategically important bridge across the river Narva on May 21, 1943 was again carried out by six sniper pilots (from the 73rd bomber regiment of the Baltic Fleet Air Force), and even trained for a whole week at a specially equipped training ground. On December 4, 1943, the Znamenka railway junction near Kirovograd was also destroyed only by "9 most

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experienced crews from the squadron of snipers "of the 81st Guards Bomber Aviation Regiment | th Guards Bomber Aviation Division of the 5th Air Army of the 2nd Ukrainian Front !!! Before them, all bombing attacks on Znamenka turned out to be fruitless...

Insufficient training of the Pe-2 crews (combined with the complexity of the "pawn" in piloting) also reduced the accuracy of bombing from level flight. Before arriving at the front, in a reserve regiment, the "pawn" crew managed to carry out a little more such bombing than diving attacks: in July - October 1941 - from 2 down, in 1942 - 2 (crews that were completed by November 1942 1st and 2nd bomber air corps - from 3 to 5), and in 1943 - 3 ...¹¹² And this despite the fact that it was almost an order of magnitude more difficult to hit the target when bombing from level flight, than from a dive! And especially on Pe-2, which - unlike L188 and He! 1] and, like the DB-3ZF, it was very unstable in level flight. This circumstance (along with poor visibility and imperfection of the OPB-1M bombsight) made it much more difficult for the navigator to aim. "And besides," recalls K.P. Ikonnikov, who flew as a navigator on DB-3, Il-4 and Pe-8, "the accuracy of strikes [from a horizontal field that. — A.S.] also depends on the flight crew. When Sergei [S.S. Sugak, commander of the Pe-8 crew of the 746th long-range aviation regiment. - A.S.] reached the target, he smoothly chose the pedal - it was impossible to sharply, so as not to shake the plane. I gave him corrections to the course, and he smoothly turned the plane. He perfectly imagined what I was doing at that time, and worked very carefully. You tell him: "Serge, another 5 degrees to the left ... a little more, on the hair ...

so, again, that's how I just did it now ... Good! Hold it like that!" You drop bombs, the plane "swells", but you need to keep it at the same level! ¹³ Was it possible to achieve such flying skills (and such skill in operating a "strict" machine) in 2-3 training bombings?

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True, according to the reports, it turned out that the Pe-2 crews arriving at the front were well prepared here (in 1941, 18.7% of the crews received "excellent" for bombing from level flight in reserve regiments, "good" - 39.7 %, "satisfactory" - 41.6%; in 1942 - respectively 22.6%, 44.3% and 33.1%; in 1943 - 26.6%, 39.7% and 33.7 %¹⁴) - but, as we have already noted, the reporting of spare parts was "inflated". At the front, the qualifications of the bulk of the Pe-2 navigators seemed to be completely insufficient: in 1942-1943, the Germans noted, Soviet front-line bombers continued to drop bombs "on the leader" ⁵. In other words, the navigators did not look at the bombsight, and on the plane of the leader! When, during an attack by nine Pe-2s of the 130th bomber air regiment of the 204th bomber air division of the 1st air army of the Western Front on the Betlitsa railway station (west of Kirov, in the Kaluga region) on June 8, 1943, the leader of one of the links missed the moment the bombs were dropped by the leader of the group, the navigators of the entire air force could not be bombed at all ...

It is not surprising that even in the directive of the commander of the Red Army Air Force dated July 7, 1943, it was recognized that "in bomber aviation, the main shortcomings are still weak defense capability in air combat and low bombing accuracy"¹⁶. Even the 1st bomber air corps of I.S. 3.07; 26.5% of the crews showed unsatisfactory accuracy, and 57.3% - only satisfactory) and even in September - October could not reach the "four" (scoring only 3.81 points and having 14% of the crews bombing for "failed", and 29% for "troika"). The 3rd bomber air corps in September-October received only 3.48 points, and in November-December - only 3.3 (respectively, 16.5% and 22% of its crews bombed "badly", and 33.5% and 35.5% - for the "troika"). Well, the 1st Guards bombing group in August - September 1943 received for

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the accuracy of bombing is "unsatisfactory" (2.71 points with 50% of the crews bombing for "failure" and 27% for "troika") ... ¹⁷ But these three corps included a large number of

most of the Pe-2 bombers available in the Red Army!

The accuracy of bombing strikes from level flight was affected not only by insufficient practice in bombing, but also by the general poor preparedness of the crews - both in flight and in tactical terms. The average duration of flights for combat use, performed by the crews of the Pe-2 in spare parts, in 1941 was only 3.5 hours, in 1942 - 6, in 1943 - 9 hours ... 18 As a result According to the Germans, "sometimes the behavior of the crews during the performance of combat missions was distinguished by passivity, associated with shortcomings in training and skills that could not be eliminated in a short time in frontal conditions" 119. So, back in the first half of 1943, KI pilots "Pawns", not being able to carry out anti-aircraft maneuver (i.e., constantly change the speed, altitude and direction of flight), were forced to bomb from high altitudes - in order to somehow escape from anti-aircraft fire. According to the Germans, the objects located in their rear, Soviet bombers in 1942-1943. attacked from a height of 3000-5500 m; recorded the enemy and cases of bombing from 8500 m! 20. This is also confirmed by Soviet data; Thus, attacking on May 6-7 and June 8-10, 1943, the German airfields in the Oryol ledge, the Pe-2 of the 204th and 241st air raid divisions (respectively, the 1st Air Army of the Western and 16th Air Army of the Central front) bombed (with one exception) from an altitude of 2750-4200 m (mainly from 3100-3500 m), and the "pawns" of the 270th bomber air division of the 8th air army of the Southern Front on May 6 and 7 were bombed at the Stalino airfield from 4000 and 4700 m (damaging only one He! 11) 121. Noted in the directive of A.A. Novikov dated July 7, 1943 "weak defense capability in air combat" - due primarily to the inability of pilots to maintain their place in the ranks of the group and the poor shooting skills of navigators and gunners-radio operators - in the summer of 1942 also forced the Pe-2

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bomb from a height of 7,000-8,000 m: German fighters had not yet climbed there. Meanwhile, only the imperfection of the OPB-1M sight required bombing from a height of no more than 3000 m! The deviation of falling bombs from the target also increased with height. The inefficiency of bombing from a height of 8000 m (when the bombs spread reached one and a half kilometers!) was revealed by the Soviet Air Force as early as the summer of 1939! 22; This conclusion was also confirmed by the Finnish war. "To bomb from a height of 7,000 meters," its member brigade commander I.I. the target is blocked: one bomb falls from one side of the station, the other - to the station, and there is almost nothing in the station itself! True, some Soviet aviators, both before and after the Great Patriotic War, had a different opinion: "high altitude does not affect the accuracy of strikes, the accuracy of hitting the target

depends on the qualifications of the navigator!"²⁴. But since the latter, as we have seen (and as we shall see in the future), did not fare well in the Soviet Air Force during the war years, bombing from a high altitude in any case should have been ineffective.

In 1944-1945, the situation with the training of pilots and navigators of the Pe-2 improved somewhat. The total flight time on the Pawns, received by the crews in spare parts, then did not grow so much: from 12-15 hours in 1942-1943, up to 17 in 1944 and 21 in 1945. However, dive bombing there began to be carried out 2.5-4 times more often: instead of two in 1943, five in 1944 and eight in 1945²⁵. The order of A.A. Novikov mentioned above on the development of dive bombing in the front regiments also had an impact. The results were not long in coming: in 1944-1945, the Germans testify, the "accuracy and effectiveness of strikes" of Soviet bombers "increased"! So, on July 15, 1944, at the beginning of the Lvov-Sandomierz operation, masses

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The controlled strikes of the "pawns" of the 2nd Guards and 4th bombers of the air corps of the 2nd Air Army of the 1st Ukrainian Front did not allow the 1st and 8th tank divisions of the 48th tank corps of the Germans to develop a counterattack inflicted by those in district Zborov - Zolochiv. At the same time, according to the testimony of the former chief of staff of the 48th Corps, F. von Mellentin, the 8th Panzer suffered "enormous losses"²⁷. The vehicles of the 2nd Guards not only attacked almost exclusively from a dive, but, like the L187 and L188, they made several passes, each time dropping part of the bombs on a new target. "I have repeatedly had to experience the "charms" of the bombing before," one of the captured officers of the 8th Tank Army testified during interrogation, "the Russian Air Force frightened me more than caused any real damage. This time everything turned out differently!"²⁸. As can be seen from the first sentence, the German did not try to adapt to the mood of the interrogators; therefore, one can also believe his report about a direct hit by a bomb on one of the tanks ...

Nevertheless, German experts noted that "shortcomings in the system for training flight crews" continued to affect the accuracy of bombing Soviet front-line bombers in 1944-1945. , is still not enough. That is why, for example, the strike of 30 Pe-2s of the 12th Guards Aviation Regiment of dive bombers of the 8th mine-torpedo air division of the Baltic Fleet Air Force against the air defense cruiser Niobe in the port of Kotka on July 12, 1944 ended in failure: pilots from the young replenishment failed to hit a stationary ship none of the 70 dropped

bombs. (For comparison: on July 2, 1942, 32 L188 [groups of the 76th bomber squadron and 32 non-111T groups of the 100th bomber squadron working from level flight (!) Dropped 170 bombs and hit 18 ships and vessels in the port of Novorossiysk, covered, we note, with more powerful anti-aircraft fire than the Niobe, as well as piers, warehouses, elevators and other coastal structures! 30.) Only after three days of training, during which each

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the pilot completed 5-6 dive bombings (i.e. doubled his experience in this matter at once!), The results improved: on July 16, a group of 23 Pe-2s from the same regiment managed to hit the Niobe with two bombs! 3!. If in the POL Binsk 2nd Guards Bomber Air Corps in the Lvov-Sandomierz operation, "pawns" were bombed almost exclusively from a dive, then in the neighboring 4th bomber bombing - only about a third of the sorties! 3 ? : not all flight personnel knew how to do this do!

The accuracy of level bombing in 1944 increased by only 11%¹³³ compared to 1943: an increase in the number of such bombings carried out by each young pilot in a reserve regiment from three in 1943 to four in 1944 (and partly in 1945)¹³⁴ was, of course, not enough... According to the Germans, even in the last period of the war, Soviet front-line bombers continued to drop bombs at the signal of the leader!¹³⁵ The low qualification of the navigators is evidenced, in particular, by the bombing in January 1945, during the Vistula-Oder operation, of Bromberg (now Bydgoszcz). The crews of the 16th Air Army of the 1st Belorussian Front, who carried it out, the Germans note, only "dropped bombs aimlessly on the residential quarters of the city" - apparently not being able to accurately cover the "German command post in a separate building, power station, gas factories and bridges across the river Brahe (Brda)"!¹³⁶.

In this last case, however, it was not the ability not to aim, but to navigate - which many Soviet crews showed even in the last weeks of the war. Thus, the bombers of the 8th Air Army of the 4th Ukrainian Front, supporting the troops of the 60th Army at the end of April 1945, during the Moravian-Ostrava operation, repeatedly bombed "in the wrong place"¹³⁷. About similar cases that took place on the first day of the Berlin operation, April 16, 1945, in the 16th Air Army, the commander of the 8th Guards Army V.I. tied all the targets, she needs to bomb the Alttuchenband. This nine, not reaching the goal, turns around, hits the Rain

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twain. I contacted myself by phone, shouting that their commander was mistaken, he hit his own. They tell me: "Listen, he made a mistake, we have now explained it to him and let's let him go a second time, he will not make a second mistake." And the second time, as luck would have it, it flies over Reinthwein, turns around and strikes in the same place, in its own, the second time. This is the weakness of our aviation!"³⁸. The poor training of the navigators of the 16th Air Force, which manifested itself in those days, was also noted by the former member of the Military Council of the 1st Belorussian Front, K.F. Telegin ...!³⁹

Tactical weakness of bomber commanders

It is possible, however, that the lack of information about the location of specific targets forced the crews to resort to non-aimed bombing of areas during the strike on Bromberg. Then we are faced with another factor that reduced the effectiveness of Pe-2 strikes - the poor tactical readiness of Soviet aviation commanders. The story of the non-targeted bombing of Bromberg was perhaps a recurrence of a phenomenon common in the first half of 1943—the neglect of combat support for bombing strikes. In particular (as noted in the directive of A.A. Novikov dated July 7, 1943), bomber aviation commanders did not then reconnoiter the target before hitting it - because of which the crews often could not detect this target at all. The Germans point to the same weakness; in their opinion, the low efficiency of bombing targets in their rear in 1942 was due to both the poor training of the Soviet crews and the refusal to preliminary reconnaissance of the target ... And to bomb Pe-2 crews from high altitudes in 1942-1943 . forced not only by the fear of German fighters and the inability to carry out anti-aircraft maneuver, but also by the inability of the leading groups to bring these latter to the target covertly - so that the attack was sudden and the German anti-aircraft gunners did not have time to prepare for firing!

Only in 1943 "pawns" began to be used and the most

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a tactically rational method of dive bombing is from the battle formation "circle" (the so-called "turntable"). Above the target, a circle (more precisely, an ellipse) inclined to the horizon began to rotate, formed by flying one after another. The Pe-2s, which dived in turn, went up, described a circle and dived again - thereby ensuring the continuity of the impact on the target. At the same time, the initiator of the use of the "turntable" - I.S. Polbin - had to independently reach the point that had long been known to the enemy. German dive bombers L187 and L188 used a similar "turntable" from the very beginning of the war!

So, at the end of July 1941, the lieutenant of the 770th artillery regiment of the 245th rifle division of the 34th army of the North-Western Front, V.M. "alternately, they suddenly fell on the wing and dived sharply at the target"! 41. And here are the memoirs of V.S. Arkhipov, who in September 1941 commanded the 10th Tank Regiment of the 10th Tank Division of the Southwestern Front: or "devil's circle," as we called this formation, and, falling in line at the peak, began to process our battle formations and the southern outskirts of Poltava "142. November 16, 1941, from the 316th Infantry Division east of Volokolamsk, the same map Well, the commander of the 16th Army of the Western Front, K.K. of the 1st Guards Cavalry Corps of the Western Front, A. Rodin saw a German "turntable" (near Zhizdra) in August 1942: "About fifteen black Junkers are diving into the village [...]. While some are bombing, others are bombing. The planes that have dropped the bombs come out of their dive and follow those that are beginning to turn. In the sky there is a devil's wheel, the plane of which is inclined towards the horizon - with a shaving edge towards the village.

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The probability of hitting the target was also reduced by the fact that the commanders of the Pe-2 units and formations resorted to massive strikes less often than the Luftwaffe - preferring to send bridges, crossings, etc. to the bombing. small groups (in the 3rd Bomber Air Corps, this was still the case in January-May 1944).

Finally, as in fighter and attack aviation, sometimes commanders simply did not want to think about organizing combat operations. Whether this took place with an unwillingness to organize reconnaissance of targets is a moot point, but for hanging under the "pawns" of the 3rd bomber air corps, sent on February 21 and 22, 1944 to bomb the bridge across the Dnieper south of Rogachev, not only 250- and 100- kg of high-explosive, but also small fragmentation (AO-25 and AO-2.5) bombs can only be explained by unwillingness to think ...

Weakness of the bomb salvo

The effectiveness of Pe-2 bombing attacks was reduced, furthermore, by its insufficient bomb load - only 600 kg and overload - 1000 kg (German La88 and He1 1] could take on board up to 2000-3000 kg of bombs)!45. Here the fact that the Pe-2 was converted into a bomber from a twin-engine fighter had an effect, i.e. originally designed

rolled like a relatively small machine. The normal take-off weight of the "pawns" varied, depending on the series, within 7700-8400 kg, and the maximum was 8700-8800 kg, while for the L88 bomber modifications this latter was 12,500-14,000 kg. He! 1] issue 1941-1944. — 13,120—15,000 kg¹⁴⁶. From the fighter, the "pawn" also inherited a wing that was not very optimal for a bomber profile. Its carrying properties on takeoff were insufficient to lift a significant bomb load into the air... The bomb load of the former fighter was also limited by the limited size of the fuselage bomb bay. Installed on the "pawns" in 1943-1945. M-105PF engines made it possible to bring the normal load up to 1000 kg, and the maximum

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nuyu - up to 1500¹⁴⁷, but only due to the internal suspension of bombs. And it was possible to expand the bomb bay only by converting the Pe-2 from a low wing to a medium wing, i.e. actually creating a new machine.

V.R. Kotelnikov and O.Yu. Leiko also pointed to the Pe-2's "considerable deadweight of the structure", "due to large margins of safety", without which the bomber would not have withstood the overloads that occur during a steep dive¹⁴⁸. The weighting of the structural elements, of course, reduced the weight of the cargo that the aircraft could lift into the air, but the L188 was also a dive bomber, and nevertheless it took three times as many bombs as the Pe-2 ...

At times, the bomb load of the Pe-2 did not even reach 600 kg. So, in the 48th short-range bomber regiment of the 17th mixed air division of the Air Force of the Southwestern Front in June - July 1941] when loading the aircraft with 50-kg bombs, it was only 300 kg (in the bomb bays there are more than six FAB-50 or ZAB-50 they didn't fit in, but they didn't want to use an external suspension, i.e. they didn't want to hang bombs on external bomb racks, under the wing, so as not to reduce the speed of the aircraft). When loaded with small air bombs, the bomb load of the "pawn" - due to the same limited capacity of the bomb bays - even at the beginning of 1944 was only 175-532 kg¹⁴⁹.

It happened, however, and vice versa - when the Pe-2 carried more than 1000 kg bombs. So, for the "pawns" of the 2nd bomber air corps of the 16th air army of the Don Front, in the period from December 13, 1942 to February 2, 1943, the average bomb load was almost 1013 kg (in 1853 sorties, the corps dropped 1877 tons of bombs); in the 779th bomber aviation regiment of the 241st bomber air division of the 16th air army of the 1st Belorussian Front in the second half of 1944, many vehicles took on board slightly more than 1000 kg (according to V. R. Kotelnikov and O. Yu. Leiko - up to 1200 kg)¹⁵⁰. However, for the main front-line bomber, this was still not enough. Moreover, in many front

units in the same 1944, the maximum bomb load for the Pe-2 was considered not 1000, but only 750 kg! 51, and in general during the period

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the most intensive use of the Pe-2, the average bomb load of this aircraft did not reach the limit of 1000 kg. In the 1st bomber air corps in 1943 it was equal to 680 kg, in the 4th bomber and 2nd guards bomber (former 1st bomber) in 1944 - 650 and 826 kg, respectively, in the 4th bomber military and 6th guards bomber (former 2nd guards) in 1945 - respectively 886 and 880 kg!22. Apparently, the same poor training of many pilots, who did not risk taking off in a car with unsatisfactory takeoff and landing properties with a whole ton of bombs on board, had an effect. In the 455th long-range aviation regiment - whose Il-4s were also quite strict on takeoff - young pilots took off with only 1000 kg of bombs, and experienced pilots started with 1250 kg and, only having mastered takeoff with such a load, moved on to 1500 and, further, to 2000 kg..153

The maximum caliber of bombs that the Pe-2 could carry was also insufficient - only 500 kg (7188 were able to lift a bomb of 1800 kg, He111] - and 1800, and 2000 kg of He111N-5 - even 2500-kilogram)154. But in practice, only "hundreds" were usually hung up: and 500- and even 250-kilogram (usual for loading German cars) bombs were used very rarely (perhaps because they did not fit into the too small bomb bay of the "pawn", but, being on an external sling, greatly increased the aerodynamic drag and, accordingly, greatly reduced the speed of the aircraft).

Counteraction of German anti-aircraft guns and fighters

This factor had a particularly strong effect on the effectiveness of the Pe-2 operations in 1941-1943. As already noted, anti-aircraft fire at that time often reduced the accuracy of 0-ohm bombing of "pawns", forcing the pilots to bomb from too high a height. And often, having stumbled upon a dense barrage, the pilots of the "pawns" completely stopped performing a combat mission, dropping bombs where

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horrible!55 (behavior attributed in Soviet literature only to "fascist vultures"...). The reasons why the German anti-aircraft artillery managed to noticeably reduce the effectiveness of the Pe-2 operations were all the same. This is, firstly, the insufficient training of the bulk of the pilots (who, at least until the middle of 1943, did not

they knew how to perform an anti-aircraft maneuver and - as the Germans note - they were lost in a collision with strong anti-aircraft fire! 56) and navigators (because of which many crews could not follow the target covertly, above the clouds, and thereby allowed the anti-aircraft gunners to get ready to shoot be). Secondly, the tactical illiteracy of the leading groups again had an effect. Both Soviet and German sources testify that, at least in 1942-1943. groups of Soviet bombers, as a rule, attacked targets "head on", very rarely approaching them from the side of the German rear. The strikes were delivered from the same heights, the combat formations of the groups were the same...! 57 As a result, knowing in advance where the Soviet aircraft would appear, the German anti-aircraft gunners spent less 2 increased significantly.

As for the German fighters, at the beginning of the war they destroyed Pe-2s at the same rate as the obsolete SBs. According to Soviet data, even in the 419th Special Purpose Bomber Aviation Regiment, which fought on the Western Front, staffed by experienced test pilots from the Air Force Research Institute, in just three weeks, from July 5 to July 28, 1941, 22 out of 38 Pe-2 (t .e. 58%) - so that for one combat loss there were not even 1] sorties! Most of those shot down were victims of fighters ... Captain Kitkin's squadron from the 411th Special Purpose Bomber Regiment was destroyed by the Messerschmitts in the midst of the Smolensk battle in just a day and a half: on July 23, 1941, they shot down 8 out of 10 of its "pawns" , in the morning of the 24th - and the last two. On July 26, Bý109 shot down the entire group of 7 Pe-2s of the 50th short-range bomber air regiment of the Zapadno Air Force

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front!58. German fighters managed to completely destroy entire groups of Pe-2s even in the winter - in the spring of 1943. So, on January 29, 1943, in the Novosil region (east of Orel), eight "pawns" from the 51st Fighter Squadron were completely killed by fire "from the 15th Air Army of the Bryansk Front, and on February 23, the same fate befell the six and eight from the 204th Bombing Air Division of the 1st Air Army of the Western Front who flew to the Zikeevo and Zhizdra regions (northeast of Bryansk). In March 1943, first eight, and then nine Pe-2s from the 6th Air Army of the North-Western Front did not return from combat missions - this was the work of E\\190 from the 54th Fighter Squadron...! 59

The impact that German fighters had on the effectiveness of the actions of the "pawns" in the winter of 1942/43 is eloquently evidenced by a comparison of the level of losses of two bomber air corps. In the 2nd - from December 13, 1942 to February 2, 1943, which worked as part of the 16th Air Army of the Don Front on the Stalingrad "cauldron" almost not covered by fighters - on

one combat irretrievable loss during this period accounted for almost as many as 132 sorties. But in the 1st - from October 30, 1942 to January 29, 1943, who fought as part of the 3rd Air Army of the Kalinin Front - there were only 29 of them in these three months: in the areas of Rzhev, Bely and Velikiye Luki, they were actively operating 190 from the 51st Fighter Squadron! 60.-

The impression that the capabilities of the German fighters made at that time on the Soviet command was such that at the beginning of the Battle of Kursk, these latter achieved success in the fight against the Pe-2 (and not tactical, but operational!) by the mere fact of their existence. Having not yet completed a single attack on the Pe-2, B {109 from the 3rd 52nd Fighter Squadron forced the daytime bomber aircraft of the 2nd Air Army of the Voronezh Front (i.e., the "pawns" of the 1st Bomber Air Corps) sit out on the airfields! Despite the presence in the 2nd Air Force by the beginning of the battle 389 (according to other sources, 502 only serviceable) fighters and its subsequent strengthening

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one fighter aviation division, the command considered that there were not enough forces to reliably cover the "pawns" - and "bomber aviation during the operation [defensive Voronezh Front, July 5-23, 1943 - A.S.] was introduced into battle very limitedly . On average, only 6 sorties were made for each serviceable aircraft! 6! — i.e. one sortie in three days ... One can understand the Soviet generals: after all, even with such a limited use in 19 days, the 1st bomber air corps lost 20% of its Pe-2s in air battles - 36 out of 179 (according to other sources, out of 172) cars! 62. For one Pe-2 shot down by "Messers" in the corps, there were only 29 sorties - while even in the previous period, in the thick of the 42nd - May 43rd, in the Red Army Air Force one bomber was lost due to combat reasons (by no means only in air battles!) on average only in 48 sorties ... 163

Why Pe-2 in 1941-1943. so suffered from the German fighters? After all, according to Soviet authors, the "pawn" had such outstanding speed data that fighters were practically not afraid of it. The maximum speed of the Pe-2, these authors pointed out, was 540 km / h (at an altitude of 5000 m) and was only slightly less than that of the Pe-2. the main fighter of the Luftwaffe "Messerschmitt VN 09" (570 km/h)! 164.

Unfortunately, here we are dealing with yet another myth of Soviet historiography (more precisely, Soviet propaganda). To begin with, only B#109E-4 had a maximum speed of 570 km/h, which, even before the start of the war with the USSR, began to be replaced in combat units by more advanced modifications of the "one hundred and ninth" and by June 22, 1941 amounted to an absolute minority of German fighters on the Eastern Front. The majority had to

VP09E-1, E-2 and E-4, the maximum speed of which was already 597-630 km / h (and the speed at an altitude of 5000 m - 595-610 km / h)¹⁶⁵. These vehicles of the B1109E (Friedrich) family not only freely overtook the Pe-2, but also managed to make "three to five attacks in pursuit"¹⁶⁶. It was still possible to break away from BE109E ("Amy Lei") by moving into a gentle, at an angle of 2-5 °, planning: on the descent, more severe

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The "pawns" quickly accelerated so that they "became almost inaccessible"! 67. However, against faster than the "Emily", BE109E, this technique seemed to be useless, and those who replaced the "Friedrichs" "Gustavs" (BE109O) in the summer - autumn of 1942 surpassed even the experienced Pe-2I in terms of acceleration characteristics - heavier and faster than ordinary "pawns"¹⁶⁸. The maximum horizontal speed of the German fighters of the Eastern Front in the summer of 1942 - summer 1943 - VP 09O-2 and Ts-4 and E \! 190A-ZiA-4 - already reached 645-666 km / h! 69.

At the same time, the Pe-2s used at the front never developed even the 540 km / h attributed to them! Only the first serial "pawns" released in January 1941 could show such speed - and even then only in "warm personal" conditions - with the machine guns removed, the screw stops and grips of the external suspension bomb racks removed and with sealed holes for them, hatches and cracks! 70. At the front, such refinement of the external surfaces of the aircraft (and even more so its disarmament), of course, was not engaged in - and the real speed of the first Pe-2s was lower. Moreover, right up to the summer of 1943, serial "pawns" became slower and slower - "with each series, with each month"! 71

Firstly, the repeated reinforcement of the Pe-2's armament and armor had an effect. This increased the weight of the vehicle, and the increased armament also worsened its aerodynamics. So, after the replacement of the TSS-1 machine gun mount in the spring of 1942 with the FT mount, the canopy of the cockpit of the pilot and navigator turned out to be, as it were, "chopped off" at the back - whereas earlier it ended with an aerodynamically very perfect fairing. The result was a loss of 3-5 km / h speed. The screen of the VUB-1 installation towering above the lantern - which replaced the 42nd FT in the summer - reduced the speed of the "pawn" by 8-12 km / h compared to vehicles equipped with TSS-1. Another 2-3 km / h "ate" an additional ShKAS machine gun, installed since July 1941, in the sides of the fuselage!

Secondly, after the start of the war, the quality of aircraft airframe manufacturing deteriorated catastrophically. Pain

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Most of the skilled aircraft builders went to the front, and the women and teenagers who replaced them found it simply "physically difficult to cope with the unyielding duralumin during a long 1] 1-hour working day"!73. As a result, the aerodynamics of the aircraft again suffered. Due to the poor fit of the hoods, hatches and fairings of the wing, numerous cracks appeared in the surface of the car; poor fit of the skin sheets led to the formation of dents, bulges and even to the distortion of the aerodynamic profile of the wing! All this "ate" up to 20 km / h in an hour! 74.

Thirdly, since the autumn of 1942, "pawns" were often made from substandard materials: factories that supplied duralumin rolled products and profiles, then reduced the range of products and production volume ... The Pe-2 skin sometimes had to be made from sheets thick | mm (instead of 0.8) and 1.5 mm (instead of 1.2)175 - and this, of course, increased the weight of the aircraft. In other cases, the skin had to be formed from sheets of reduced size, which caused aerodynamics to suffer, because many extra joints appeared on the surface of the car. The joints were even on the toe of the wing consoles - the most important, from the point of view of aerodynamics, part of the airframe! Sometimes aircraft manufacturers were forced to use simply defective sheets - with cracks, undulations, bulges ...

The aerodynamic drag of serial Pe-2s thus increased, as did the weight, while the power of the engines, meanwhile, remained virtually unchanged. True, from the beginning of 1943, instead of the M-105RA, they began to install somewhat more powerful M-105PF, but they were lower in altitude and, having provided some increase in speed near the ground, significantly reduced it at altitude. And if the maximum speed of the Pe-2, released in August 1941, was 530 km/h, then in March 1942 it decreased to 520 km/h, in May - to 503-505 km/h, in June - up to 488-515 km/h, in August reached 504 km/h, in September-November - up to 494 km/h, and in January-April 1943 it dropped to 475-482 km/h!76. (Data shown by one or two

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aircraft randomly selected from one production series; for other cars of the same series, the speed could differ by several km / h.)

Thus, during the whole year of the war - from the summer of 1942 to the summer of 1943 - the maximum speed of the Pe-2 was only slightly higher than that of the German L188 bomber (which then developed 470-475 km / h! 77), in winter and in the spring of 1943 - generally the same. But the emphasis on the significant superiority of the "pawn" over the L188 in terms of speed is another common place in Soviet aviation history literature!

But that's not all. The above figures show the speed that the Pe-2 developed without bombs on an external sling and without external bomb racks. With the installation of the last 530 km / h, they turned into 508, and with the suspension under the wing of two 250-kg bombs - 492 km / h! "8. Meanwhile, in the second half of the war, when the "pawns" began to bomb more often from diving, it was impossible to do without an external suspension, because the bombs that were in the bomb bay, Pe-2 (unlike L188) could not drop from a dive: it lacked a mechanism that "pushed" them out of the "belly" of an aircraft rushing down ...

In the spring of 1943 urgent measures were taken to improve the aerodynamics of the Pe-2. After they began to close the gaps and joints, improved the internal sealing of the aircraft, changed the shape of the oil coolers and hoods, "drowned" the locks and grips of the external bomb racks into the wing, began to more carefully interface the screen on the VUB-1 installations with the canopy, etc. , in July - September 1943, the serial "pawns" began to show the maximum speed (it was now achieved at an altitude of 3700 m) up to 521-524 km / h. However, later Plant No. 22 (which at the end of 1942 became the sole manufacturer of Pe-2s) and aircraft engine plants again began to violate technological discipline, and in April-August 1944 the speed of serial Pe-2s decreased to 496-518 km/h (however, already with external bomb racks and machine guns) ... And only by the end of 1944

managed to increase it again (in the same combat configuration, at an altitude of 3900-4000 m) to 520-524 km/h!79.

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But under conditions when the new "Messerschmitts" (B11090-6, S-14, S-10 and K-4) and "Focke-Wulfs" (E! 190A-8 and O-9) developed at the same heights up to 615 - 650 km/h!80, and that was not enough. "The horizontal speed of the Pe-2 aircraft," noted in May 1944 at the General Staff of the Air Force, "due to its use mainly in the zones of greatest opposition from enemy fighters, it requires an increase of 20-30 km / h even compared to 205- th series [i.e. up to 540-550 km / h. - A.S.18 (]. This will increase the freedom of action of the dive-bombers and make it difficult for fighters to overtake him [so in the text. - A.S.], and in combination with a high dive speed (up to 750 km / h) will ensure separation from them in air combat! 32.

However, this wish was never fulfilled. Once again, the main problem of the Soviet aircraft industry of those years, the lack of reliable powerful engines, had its effect. It would seem that the engines of the M-82 family will solve the problem: in April 1943, the Pe-2 with the M-82 developed (at an altitude of 6250 m) the desired 547 km / h. However, 24 serial "pawns" with the M-82F, produced in 1943-1944, could show no more than 526 km/h: the new engine was extremely unreliable¹⁸³. Unsatisfactory work of carburetors and high-rise cor-

gas reactors did not allow to give full throttle at altitudes of more than 3000-4000 m. In addition, it was difficult to keep the bomber with the M-82F in the ranks of the group: due to the vagaries of the carburetor, the motors spontaneously either reduced or increased thrust - and the car scoured the course. And the M-82FN, which did not depend on the vagaries of the carburetor, was completely taken over by the factories that built the La-5FN and La-7 fighters. Yes, however, these engines were hardly acceptable either: they often "handed over" due to candle failures, and because of their significantly greater weight compared to the M-105PF, the already unsatisfactory landing qualities of the Pe-2 would worsen. .. Another powerful and promising engine for a "pawn" - the M-107 - was also not brought to an acceptable level of reliability. And the German engine with the Soviet designation M-1 (which allowed the Pe-2 to develop 562 km / h184) was not put into production, as they relied on the M-107 ...

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In general, during the entire war, the conclusion made by the Soviet aviation command back in the summer of 1941 remained true for the Pe-2: "[...] Defense due to superior speed is no longer valid!"³⁵.

Well, defensive weapons? On the first 140 "pawns" it consisted of the same four 7.62-mm ShKAS machine guns as on the SB - and they were placed no better than on this last one. Half of the barrels could again only fire forward, although enemy fighters attacked much less frequently from the front than from behind. Moreover, unlike the SB, both nose ShKAS Pe-2s were not mobile - so that the pilot could only wait for the Messerschmitt to be right in front of him ... The ShKAS, which fired up and down, was placed in the cockpit and a navigator on a very unsuccessful TSS-1 turret. As was the case with the Tur-9, which was installed on most of the SB, when installing this turret, they cared primarily about the aerodynamics of the aircraft, and not about the effectiveness of firing. Therefore, the TSS-1 required time to transfer it from the marching to the combat position: the navigator had to release the clamps of the plexiglass fairing - after which it "sunk" in the fuselages, and the ShKAS thrown to the side of the cockpit was thrown up. But even after that, he had insufficient firing angles along the horizon - only 45 ° to the left and right of the axis of the aircraft. In addition, in the combat position, the TSS-1 turned out to be completely open from behind, and the airflow prevented the navigator from deploying a machine gun ... The fourth ShKAS, as on the SB, fired down and back through the lower hatch of the rear fuselage. Perhaps the only advantage of this, the original version of the Pe-2 armament compared to the SB, was that the machine guns that covered the bomber from behind were served by each of their crew members (the upper one was the navigator, and the lower one was the shooter of the com-radio operator) and could therefore fire simultaneously .

Approximately from the 140th aircraft, from May 1941, instead of the right bow and lower ShKASSs, they began to install 12.7-mm Berezin machine guns - first BT, and from the summer - UBT.

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From this powerful weapon with a muzzle energy of 1634 kgm (five times greater than that of ShKAS) and a 48-gram (again, five times heavier than ShKAS) bullet⁸⁶ it was possible to reliably hit Messerschmitts even at long distances - 400 m more. However, the most dangerous sector ("behind-top") was still covered by the underpowered ShKAS. And the design of the lower installation was far from ideal. The large-caliber machine gun in it was mounted on the LU-Pe-2 turret - a modified MV-2, which was very inconvenient to maintain in the cramped fuselage of the "pawn". The OP-2L periscope sight, as already noted, had a very narrow field of view, and after several sharp maneuvers of his or the attacking aircraft, the gunner-radio operator lost spatial orientation. And to restore it, clinging to the blisters in the sides of the fuselage, was not easy: these oval windows provided a view only to the sides. Finally, the sleeve through which the cartridge belt was fed into the lower BT (UBT) was initially rigid, due to which the tape sometimes jammed after the first shot ...

Having tested both of these variants of defensive weapons in the July battles of 1941 (with 4 ShKASSs or with 2 ShKASSs and 2 Berezin machine guns), front-line crews (for example, in the 410th Special Purpose Bomber Aviation Regiment and the 13th High-speed Bomber Air Force of the Western Front) rated the small arms of the "pawn" as weak and "insufficiently thought out"³⁷. This was superimposed on the poor shooting skills of Pe-2 navigators and the tactical literacy of German fighter pilots. So, during the battle of Smolensk, the pilots of the 51st Luftwaffe fighter squadron attacked the "pawns" from behind and above - where the bomber had not a BT, but a ShKAS. At the same time, even from long distances, they began to fire at the Pe-2 from machine guns - thereby provoking inexperienced Soviet navigators to return fire, i.e. waste the ammunition load of the ShKASS, which is ineffective at these distances. After the navigator ran out of ammunition (due to the exceptional rate of fire of the ShKAS, this happened very quickly), B # 109 quickly

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approached the bomber and with impunity shot him at point-blank range with a cannon - trying to hit the gas tanks. The latter were protected and had a nitrogen blowing system, which, it would seem, should have prevented their ignition. However, at the field airfields, apparently, there was no nitrogen - and only protectors could not

prevent a fire if the tank was hit from a cannon (or from machine guns, but with incendiary bullets). In addition, the Germans quickly discovered that the Pe-2 was not protected from expendable fuel tanks, which were located next to the engines. This, apparently, is why the pilots of the 13th high-speed bomber regiment who participated in the battle of Smolensk noted the high fire hazard of the "pawn" - although the same V. Shvabedissen points out that it was difficult to set fire to the Pe-2 even in 1941! Difficult - but for an experienced fighter pilot it is quite possible ...

True, if the Pe-2 was at least nine and they flew in tight formation - which made it possible to meet attackers with concentrated fire from several aircraft - ShKASs could also save them. Thus, during the battles of the "pawns" of the 40th bomber regiment of the Black Sea Fleet Air Force with B109 over the northern approaches to the Crimea in October 1941, a "pattern" was revealed: Pe-2 groups in the nine suffered losses only in those cases when individual planes, for one reason or another, broke away from formation¹⁸⁹. The fiery trails that stretched towards them immediately from nine Sov HQs had a strong psychological effect on the Messer PILOTS and forced them to withdraw from the attack even at a distance of 500-800 m, from which it was almost impossible to hit the bomber. But after the B1109 was equipped with frontal bulletproof glass in the fall of 1941, their pilots began to frankly ignore the low-powered ShKASs of the Pe-2 navigators. In the winter-spring of 1942, they fearlessly approached the Pe-2 from behind at 100-150 m and calmly shot at the tail of the Ka bomber. "[...] We are being shot down like chickens," one of the "pawn" pilots then said bitterly!⁹⁰.

True, back in late July - August 1941, the power supply system of the lower BT (UBT) was debugged on the Pe-2 and a fifth

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a machine gun - ShKAS - for which a ball mount was mounted on both sides, so that the gunner-radio operator could transfer this machine gun from side to side (in February 1942, ball mounts were replaced with pivots with a slightly larger firing angle). However, the most important machine gun in air combat, the upper one, was replaced by a large-caliber UBT only in April-May 1942 (manufacturers were afraid of the slowdown in the rate of aircraft production that was inevitable with such a redesign). What this delay cost the front-line units can be judged by the behavior of front-line pilots who arrived at factory No. 22 for new "pawns". They "flatly refused to accept machines equipped according to the old model. Sometimes it came to threats with weapons [...]"¹⁷¹. It is not for nothing that the first version of the UBT installation in the cockpit of the pilot and navigator was called FT - "Front Demand" ... True, it was just a pivot installation with the same small angles of fire along the horizon as the TSS-1, and in exactly the same way open at the back (so that the air flow interferes with the

return the machine gun). But in June 1942, the FT was replaced by a fully shielded VUB-1 turret with firing angles of 110° to the left and 88° to the right.

At the same time, in the spring of 1942, Pe-2 gas tanks began to be pressurized not with deficient nitrogen, but with cooled exhaust gases from engines. Subsequently, such a "neutral gas" began to be supplied to the compartments in which the tanks were located (gasoline vapor also penetrated there).

However, the installation of the upper collar and improving the survivability of the "pawn" in 1942 and 1943. partially depreciated by a number of circumstances. Firstly, the decrease in the maximum speed of the Pe-2 during this period to 475-495 km / h made itself felt. Having an advantage here already at 100-150 km/h, B-109 and B-190 could easily take up a position for an attack in a sector that was not shot through by large-caliber "pawn" machine guns. For example, to enter strictly from the side or from the top side: due to the inefficiency of its aerodynamic compensators, the VUB-1 turret was quite difficult to turn at an angle of more than $40-50^\circ$ from the axis of the aircraft (no wonder, according to the crews of the pawns, it provided

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the arrow is not $88-110^\circ$, but only $50-65^\circ$), but the low-power airborne ShKAS could not guarantee a reliable defeat of a fighter ... In general, the defensive armament of the Pe-2, "according to the aviators, by the summer of 1943" again became insufficient!??.

Secondly, they summed up the tactical mistakes of Soviet aviation commanders. Back in the first half of 1943, many leaders of the Pe-2 groups, instead of taking the fight in close formation, tried to break away from the German fighters at high speed. Still, it was not possible to get away from the aircraft, whose speed was 100-150 km / h more, and the formation of the group was inevitably stretched. Some, poorly trained pilots, were not able to stay in formation at high speed, others lagged behind due to the deterioration of the engines or the entire aircraft ... And with the disappearance of the compact formation, the fire interaction of the bombers also disappeared. They were no longer able to concentrate defensive fire on one target - helping out, for example, that "pawn", the navigator of which could not turn the turret towards a fighter that came in from the side. The density of the fire that met the attacking fighter was sharply reduced... The significance of maintaining a tight formation is well shown by two episodes of the combat work of the 1st bomber air corps of the 2nd Air Army of the Voronezh Front over the southern face of the Kursk Bulge on July 5, 1943. Of the nine The 82nd Guards Bomber Aviation Regiment of the 1st Guards Bomber Aviation Division, which managed to keep the line, B-109 managed to shoot down only one car. And the nine of the 854th bomber aviation regiment of the 293rd bomber air division, whose formation was broken, lost six "pawns" from the fire of "Messers" at once!93.

The battle formations used by the Pe-2 were then poorly adapted for defense. The units or squadrons that made up the group were not separated in height - and the fighters that came in from behind were under fire only from the end level. Finally, groups of bombers traveled to and from the target by the same routes - thus making it easier for the Germans to detect ... Finally, the Soviet command too often issued

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pawns were fired into the air in small groups (nines, pairs of nines), the density of defensive fire of which, with the increased gap between Pe-2 and German fighters in speed, was already insufficient. Thirdly, both German and Soviet sources state the weakness of the shooting skills of the navigators and gunners-radio operators of the Pe-2 in 1942-1943. Thus, according to the Germans, the crews of Soviet bombers still opened fire too early, from distances at which he could not cause any harm - i.e. ammunition was wasted in vain! 3°. The destruction of three Pe-2 groups from the 1st and 15th Air Army in the winter of 1943 by Fokkers from the Mölders squadron (see above) revealed "the complete lack of training for the crews of our bombers to conduct active defense as a group against enemy fighters"! 3°. Fourthly, the high proficiency of the Messers and Fokker pilots continued to have an effect. What were their capabilities in the fight against the Pe-2, even at a later time, can be judged from the air battle that took place on April 19, 1944 over the Black Sea in the Sevastopol region, in which a single E \! 190 attacked a group of three "pawns" of the 135th Guards Bomber Aviation Regiment. According to the recollections of N.A. Bondarenko, who survived this battle, in the first run the German managed to set fire to two (! - A.S.) bombers at once - and in the second hit the third; the whole group ended up shot down!95. But he was a pilot from the P group of the 2nd assault squadron - for which the hunt for Soviet aircraft was only a "side" occupation. What then to say about real fighter pilots! The four B1109 from the [group of the 3rd fighter squadron, which attacked on December 18, 1942 nine Pe-2s from the 2nd bomber of the air corps, opened fire from a distance of 400 m and stopped it 150 m from the target. But all four pilots hit the target: according to Soviet data, four "pawns" were shot down! And the four E\\!190 from the [group of the 51st Fighter Squadron, which attacked eight Pe-2s from the 15th Air Army of the Bryansk Front on January 18, 1943, set fire to all eight vehicles within two minutes!97 the Germans countered the formation of "pawns" with attacks from different

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directions - forcing them to disperse the defense

hearty fire...

Fifth, the increase in 1943 in the fleet of German fighter aircraft in the share of E \ 190 machines with their exceptionally powerful armament of four cannons and two machine guns and increased survivability did not go unnoticed. Crews shot down by Fokkers on February 23, 1943 (see above) 14 "pawns" of the 204th bomber air division "previously repeatedly repelled attacks" 12-15 "Messers" - and in general cases of complete death of groups of Pe-2 divisions before the appearance E\\190 did not know!8. Both Soviet and German sources testify that the rugged Fokkers, with their durable air-cooled engines, often ignored pawn fire and charged into their battle lines to split the group.

Sixth, the vitality of the "pawn" should not be exaggerated. The German pilots retained a strong idea of the Pe-2 as an aircraft that is difficult to set on fire! 99, but it seemed to them so, apparently, only in comparison with the SB, DB-3 and DB-3F. The crews of the "pawns" themselves, back in the summer of 1943, believed that the system for filling tanks with inert gas did not provide adequate protection against fire; in the analytical materials prepared by Soviet staff officers by the summer of 1943, significant crew losses were stated from the ignition of the Pe-2200 central gas tank hit by bullets and shells.

The fighter cover of the "pawns" in 1942-1943. often acted tactically illiterately. It also unsuccessfully built its battle formation (leaving the sectors most dangerous for bombers unprotected), and in battle it often abandoned its wards, being carried away by active air combat with the attackers ...

But in 1944-1945, the Germans note, the Pe-2 began to resist the Luftwaffe fighters much more successfully. German experts see the reasons for this primarily in "a decrease in the activity of the German fighter

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aviation" and in the increase in the number of aircraft in groups of Soviet bombers?11.

The first of these factors (as in the case of the loss dynamics of the Il-2 attack aircraft) was clearly not of paramount importance. To be convinced of this, it suffices to compare two air battles involving the 1st (from February 1944 - 2nd Guards) bomber air corps - the entrance to the defensive operation of the Voronezh Front near Kursk on July 5-23, 1943 and in the Yassy area 30 May - June 8, 1944. In both cases, the Germans brought into battle over a short section of the front large forces of Bf109 fighters - four groups on the southern face of the Kursk Bulge, and three groups near Yassy. But if over the Kursk Bulge

Since the launch in 19 days lost 20% of the Pe-2s from the attacks of the Messerschmitts, which it had by July 1 (36 machines out of 179), then the over-Druman Moldavia in it was shot down in it for the whole of May - and by no means only by fighters! - only about 1.4% of the "pawns" available at the beginning of the month (2 out of 141), and for the whole of June - only about 2.6% (4 out of 156)202.

It's just that in 1944 the level of training of Pe-2 pilots and the level of tactical literacy of Soviet aviation commanders increased. The group flying of crews has improved; now, the Germans remarked, "the bomber units remained in formation even when attacked by German fighters"?93. Accordingly, the density of defensive fire has increased! And in general, according to the Germans, in 1944-1945. in aerial combat, Soviet bombers "acted more unitedly, without the nervousness and clumsiness that had previously been characteristic of them"...204 The increase in the average number of Pe-2 groups noted by German experts was also of great importance. This again made it possible to create such a density of fire from heavy machine guns in the path of the attacking "Messers" or "Fokkers" that only a surprise attack could be successful. The improvement of battle formations also led to the same result. For example, a group of 27 "pawns" could fly in a "snake of squadrons" - when the middle nine went above or below the head and trailing. As a result, after forging any of the squadrons, German fighters

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fell under the crossfire of the upper UBT of the one that flew below, and the hatch ones - of the one that was at the top ...

Let us note, however, that in the last period of the war, Luftwaffe fighters could at times significantly reduce the efficiency of the Pe-2. If on the way to the goal, the "pawns" managed to maintain the correct tight formation, then when leaving home, not always. According to the observations of V.T. for this "a lot of [\$1c! - A.S.] of our dive bombers. When the "pawns" were turning back, one or two German fighters cut through their scattered formation at high speed and were sure to shoot down several of our planes? 05. Since this was repeated many times, the stretching of the formation should be attributed not to the relaxation of the pilots after completing the combat mission (the first loss should have ended with relaxation), to the atom that the qualifications of the Pe-2 pilots left much to be desired in the 45th. In order to form a compact battle formation in a calm situation in the area of your airfield and maintain it, flying in a straight line, this qualification was already enough - but in order to quickly restore the correct marching formation after rebuilding into a shock "circle" and strike on

goal, it was still, apparently, insufficient ... Obviously, the complacency of the Soviet command also affected, which, having achieved air superiority in 1944, increasingly attracted the fighters accompanying the "pawns" to joint with the latter strikes against ground troops - that is, it deprived the bombers of fighter cover when moving away from the target! According to the observations of V.T. Fedin, having escorted the Pe-2 to the target, the "hawks" left them and disappeared - apparently, precisely for inflicting their own bombing attack (as the Germans testify, this practice was typical for the Soviet Air Force just in the spring of 45 th? 96) ... In the northern sector of the council of the Sco-German front, the preservation of the action

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the groups of the 54th fighter squadron that fought there were the backbone of experienced pilots - who, moreover, flew on the "killers" E\U\190. So, at the end of July 1944, over North-Eastern Estonia (between Rakvere and Narva), the "Fokkers" of the "Grunherz", ignoring concentrated fire, confidently attacked a column of 534 (!) "Pawns" of the 34th Guards and 58 th bomber aviation regiments of the 276th bomber air division of the 13th air army of the Leningrad Front and shot down at least three Pe-2297s in the top nine. If in the 6th Guards Bomber Air Corps in 1945 (when it flew over Poland, Silesia and Brandenburg) fighters accounted for 29.1% to 45.4% of the combat irretrievable losses of the Pe-2, then in 1- m guards bomber in the second half of 1944 (when he operated over the Baltic states, i.e. in the same place as the Grünherz squadron) - 57.3% ... 208

However, even with a decrease in losses from fighters, the total combat irretrievable losses of the Pe-2 after 1943 decreased very slowly. If in July of the 43rd in the 1-th bomber air corps for one "pawn" irretrievably lost for all reasons, there were 24, and in the 3rd bomber air corps - 41 sorties, then in the 4th bomber air corps in 1944 - 43 (per one combat irretrievable - 57), in the 1st Guards Bomber even in the second half of 1944 - also 43, in the 6th Guards Bomber in 1945 - 88, but only for one combat irretrievable loss. ...209

8. ABOUT THE COMBAT WORK OF BOSTON BOMBERS

As already mentioned, the second largest Soviet daytime front-line bomber in 1942-1945. was an American Douglas A-20 aircraft, which in the USSR (as in England) was known under the name "Boston" (early modifications of this aircraft - OV-7V and C, "Boston" Shi A-20S - officially in the Soviet Air Force were designated as B-3, and for subsequent ones - A-20Vi C - retained their American designation; however, instead of

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"A-20S" in Soviet documents wrote "A-20Zh"). As luck would have it, this aircraft was by no means designed as a bomber: it was conceived as an attack aircraft - and therefore, like the Pe-2, it was a relatively small aircraft. The maximum flight weight of the Bostons (9,900-10,900 kg) was only slightly more than that of the former Pe-2 fighter, and the maximum bomb load was at first only 780-940 kg. However, one and a half times more powerful than the Pe-2, the engines made it possible to lift even more, and already in the summer of 1942, after appropriate alterations, B-3s began to be taken on board up to 1200-1300 kg. Used at the end of 1942, the B-3 outfit A-20V first lifted 1000 kg of bombs, and in the summer of 1943 their bomb load was increased to 1600-1800 kg (from concrete strips - at the front, however, rarely used - A-20 could take off with two tons of bombs). Up to 1800 kg, the A-20021 received from the summer of 1943 was also raised. Thus, from the second half of 1943, the Bostons significantly surpassed the Pe-2 in terms of bomb load and were brought to the level of the Il-4 (DB-3F) - however, they were still inferior to the German L188 and He111 ... In addition, they could not carry bombs with a caliber of more than 250 kg - yielding here even to the Pe-2.

As for the accuracy of bombing, the Bostons could only bomb from level flight, and in terms of sighting equipment, the vehicles supplied to the USSR did not have any advantages over the Pe-2 and Il-4. The Americans equipped only those A-20s that served in the US Air Force with the Norden high-precision bombsight, and the Soviet navigators at first, in the summer of 1942, were forced to use the primitive American O-8 Vimperis, and then - all the same imperfect Soviet-made sight OPB-1 (in the OPB-1R version). Nevertheless, the "Boston" could still provide a somewhat greater accuracy of bombing from level flight than the Pe-2 and Il-4: it did not suffer from the longitudinal instability characteristic of these machines and was much simpler and easier to pilot. As a result, it was easier for the pilot to bring the aircraft to a combat course and keep it on it during the bombing.

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The ability of the "Bostons" to resist the German fighters turned out to be about the same as that of the "pawns". According to high-speed data, these aircraft were very close. B-3s in the summer of 1942 developed (at an altitude of 4500 m) 530 km / h, therefore surpassing the then Pe-2s; in 1943, due to the increase in the bomb load and the strengthening of defensive weapons, the maximum speed of the "Bostons" decreased, and the A-20 was already somewhat inferior in this indicator to the well-made "pawns"? 12. defensive

armament also went through the same evolution as on the Pe-2. In the spring and summer of 1942, the B-3, like the early "pawns", were equipped with machine guns of only rifle caliber - 7.7-mm English "Brownings", - and only three of the seven barrels were able to penetrate the most dangerous, rear hemisphere (two at the top shooter and one at the bottom). And the upper turret - again, as in the early "pawns" - had insufficient firing angles and required time to bring it from marching to combat position. Therefore, in the summer battles of the 42nd, Bostons were shot down by Messerschmitts as easily as the early Pe-2s (of course, the difference in the qualifications of the then Soviet and German pilots also affected). For example, the 221st bomber air division of the Air Force of the South-Western Front lost 27 planes - 13, i.e. over a third of the staff. However, in September 1942 - early 1943, all the "Bostons" of the Soviet Air Force were rearmed with large-caliber Berezin bullets. Instead of the upper pair of Brownings, one UBT was installed on the screened turret UTK-1, instead of the hatch "Browning" - UBT on the LU-Pe 2 installation, four fixed "Brownings" that stood on the sides of the navigator's cabin and fired forward were replaced by two UBCs. Since then, all those who have entered the SSRA-20 have been re-equipped in the same way; on the A-20S, the top gunner even began to have two 12.7-mm machine guns - first the UBT, and then the American Kolg-Brownings, which were mounted on an effective electrified turret back in the USA ... In other words, the defensive weapons of the Bostons brought to the level of modern Pe-2, and in July 1943 in those units participating in the Battle of Kursk and

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formations that were equipped with Bostons (in the 22nd] bomber air division of the 16th air army of the Central Front, the 244th bomber air division of the 17th air army of the Southwestern Front and the 454th bomber air regiment of the 2nd air army Voronezh Front), the level of irretrievable combat losses turned out to be the same as in the formations of "pawns" (in the 1st 3rd bomber air corps) - respectively 8 and 7 vehicles per regiment? 14. In 1944, in the irretrievable combat losses of Bostons and Pe-2s of the Red Army Air Force, the share of the former was 24.3% (166 vehicles versus 517 Pe-2s) - which is no more than their share in the total number of vehicles of both types used at the front this year. Note that the combat survivability of the Boston was supposed to be enhanced by the fact that, unlike the Pe-2, it flew freely - without height restrictions - on one engine.

In general, starting from 1943, the "Boston" - this larger bomb load than the "pawn", the best piloting qualities and greater power supply with no less effective bomb sights and defensive weapons and approximately the same maximum speed - was more adapted for bombing

strikes from level flight than the Pe-2. However, German experts did not note any difference in the effectiveness of bombing attacks between these two types of aircraft. V.G. Torbach reasonably notes that the persistent attempts of the Germans to block the airfields from which the 244th bomber air division of the 17th Air Army of the Southwestern Front operated in August 1943 should indicate the high efficiency of its A-20 (who then bombed the railway junctions of Slavyansk, Krasnograd and Barvenkovo)?¹⁶. However, their repeated bombardments of the Donbass airfield, where the 3rd group of the 2nd dive squadron of the Luftwaffe was based in late August - early September 43, proved to be of little effect. "Our losses in aircraft and equipment," witness

17A. Smirnov
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H. W. Rudel, who then commanded this group, were insignificant"?¹⁷.

In any case, the effectiveness of the Bostons' actions could not but be affected by the same insufficient training of the crews as the Pe-2. Poorly prepared for individual actions (who had not mastered, for example, anti-aircraft maneuver) pilots in units equipped with Bostons were sent back in 1944 - for example, to the 13th Guards Long-Range Bomber Aviation Regiment, attached in April of that year, before the Crimean operation, to the air forces of the Black Sea Fleet. As a result, the loss of 10 trained crews on May 10, 1944, this unit was forced to sharply reduce the activity of its operations on the Sevastopol-Constanta sea lane: it was impossible to use young reinforcements in battle... where unsuitable even in the last six months of the war. "Once again, they are bombing superbly badly, it's just some kind of shame," said the same H.U. Rudel, describing one of the A-20 raids of the 17th Air Army of the 3rd Ukrainian Front The German assault squadron attacked the Varpalota and Kemmelde airfields in Western Hungary in December 1944. And on May 8, 1945, attacking a convoy of the same squadron in the Sudetes, the Bostons covered it, located about a kilometer from the road, the town of Nimes. "The Russians are making a second run," Rudel recalled. "But even on the second attempt, they cannot destroy our column"?¹⁹.

9. WHY WAS THE IL-4, TU-2, and V-25 ALMOST NOT USED AS DAY BOMBERS?

Insufficient training of crews should, without any doubt, be called the first of the two main shortcomings of the Soviet daytime front-line bomber aviation of the period 1942-1945. Another such disadvantage is

recognize the small size of the bomb load of its aircraft. In conditions where, ranging from two-thirds to three-four

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The Pe-2 aircraft fleet actually took on board only 650-850 kg bombs (three times, atoms and four times less than German vehicles of the same purpose!), Not only the task of reliably hitting targets became more complicated, but also the problem of logistical support for actions bomber aviation. After all, the smaller the bomb load of an aircraft, the more machines have to be attracted to perform the same combat mission. And consequently, the maneuver by the forces of bomber aircraft, concentrations on one or another sector of the front, became more complicated. Thus, in preparation for the Vyborg offensive operation in May 1944, it became clear that in order to ensure the breakthrough of the Finnish fortified zones on the Karelian Isthmus, the 13th Air Army of the Leningrad Front would need to be reinforced with at least six Pe-2 divisions. However, the rear of the 13th Air Force "would not have been able to serve such a number of bombers on its own, and we would have been forced to strengthen it at the expense of the rear units of aviation from other fronts. And the transfer of air rear services is a complex and lengthy business"225.

To increase the number of A-20s that were twice as heavy as the Pe-2 was not in the power of the Soviet leadership, which depended here on supplies from the United States. However, throughout the war in the USSR, the Il-4 aircraft was built in large quantities (as the DB-3F was called from March 26, 1942), the bomb load of which was even greater than that of the A-20 (theoretically, up to 2500 kg). And in March 1942, the production of the Tu-2 bomber, designed under the guidance of A.N. Tupolev, began, which raised up to 3000 kg bombs? 2! — i.e. finally caught up with the German cars! It was these aircraft that helped to get out of the predicament described above, which arose during the preparations for the Vyborg operation. Instead of six Pe-2 divisions, one division was then transferred to the IL-4 and one to the Lu-2 to the Leningrad Front, i.e. three times less aircraft, which did not require additional redeployment of aviation rear units. And the bomb salvo of these two divisions was the same as that of the six "pawn" divisions!

Provided major benefits and significantly

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greater than the Pe-2, the flight range of the IL-4 and Tu-2: thanks to it, these bombers (again, like the German ones) did not need to be relocated so often. Having completed, for example, their work in the Vyborg operation that began on June 10, 1944, they began to act from the same airfields of the Leningrad air hub in the interests of the neighboring

th front - Karelian, which on June 21 began the Svir-Petrozavodsk operation. For this, Pe-2 aircraft "would have to be relocated to the airfields of the 7th Air Army of the Karelian Front - whose weak rear could hardly cope with servicing an additional number of bombers ... As early as February 3, 1943, in a report addressed to I.V. Stalin, the commander of the Red Army Air Force A.A. Novikov pointed out the need to replace the Pe-2 with another aircraft, since "when coordinating the actions of aviation from two or three fronts, it is not possible, due to the short range, to use bombers based on one front for attacks on the objects of the neighboring front"?2.

However, both Il-4 and Tu-2 as daytime front-line bombers in 1942-1945. were used on a very limited scale. At that time, only the 113th bomber air division flew the Il-4 in front-line aviation - and then only from July 1943 (it was she who bombed the Finnish fortifications in the Vyborg and Svir-Petrozavodsk operations). The vast majority of newly produced machines of this type were taken by long-range aviation (ADD), which used them at night and only in April 1945 (already being transformed into the 18th Air Army) began to release them occasionally on combat missions during the day. (The exception was the actions in the summer - autumn of 1942 in the Arctic of two dozen cars of the 35th long-range air barrage regiment ...) And the Tu-2 was produced in very limited quantities. In 1942, they managed to build only about 80 of these aircraft, in 1943 - 17, in 1944 - 378 (whereas Pe-2 - 2944, and Il-4 - 706), and in the first four months of 1945 - th - about 325223. The accumulation of Tu-2 in the front-line units was very slow, and in 1942-1943. only two regiments fought on them - the 12th and 132nd barrage bombers (the first from the fall of the 42nd to the fall of the 43rd on Ka

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Linin front, and the second from the fall of the 42nd to April 43rd on the Kalinin and South-Western), and from June 1944 until the end of the war - only one division (334th bomber, operating first over the Karelian Isthmus and the Ladoga Karelia, and then over Lithuania and Latvia). "Built in insufficient quantities," summarizes W. Schwabedissen, the Tu-2 bomber "could not have a significant impact on the course of the air war" on the Soviet-German front??4.

What were the reasons that limited the use of Il-4 aircraft and the production of Tu-2 aircraft during the day? As for the "silts", the Soviet command could not, of course, ignore the sad experience of the daytime use of these bombers in 1941, when they suffered huge losses. One of the reasons for these losses - the high combat skill of German fighter pilots - was beyond the power of the Soviet leadership to eliminate; In fact, in the "quantitative" thinking of the Soviet leaders, there was another thing that could not be eliminated - insufficient preparation

crews. But it was quite possible to strengthen the weak defensive armament of the IL-4. And with the deployment of the mass production of fighters by the beginning of 1943, it became possible to give the Ilyushin bombers the fighter cover they lacked in the 41st. It was decided to implement both of these possibilities after I.V. Stalin set the Air Force and the People's Commissariat of the Aviation Industry on February 11, 1943, a long overdue task: to ensure the widespread use of the IL-4 not only at night, but also in daytime conditions. Note that the game was all the more worth the candle, since by the 43rd the accuracy of bombing from the IL-4 should have increased. Indeed, at the end of 1942, it was finally possible to eliminate the strong longitudinal instability inherent in this aircraft - by installing on it a wing with an increased sweep of the leading edge of the consoles ("with an arrow"). Piloting the IL-4, and hence keeping it on the combat course, became much easier after that.

Back in the spring of 1942, instead of the upper ShKAS, the IL-4 was equipped with a UBT heavy machine gun on the shielded UTK-1 turret; in many front-line units at UBT

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the lower, hatch ShKAS was also replaced. Now, at the beginning of 1943, they developed a variant of arming the Ilyushin bomber with four UBTs: on the upper turret, in the lower hatch and two ball mounts in the sides of the rear fuselage (a fifth was also installed on the experimental machine - instead of the ShKASS, which fired forward). At the same time, to service the onboard UBT, the crew had to include one more, third shooter. As a result, the protection of the IL-4 from attacks from the most dangerous, rear hemisphere would be better than the Pe-2 and Bostons, and at least worse than the German analogue of the silt - He111. The most common Heinkel modifications in 1943 - He111N-6, N-PiNN-16 - the rear hemisphere was protected not by four, but by five or seven trunks, but on He! 11N-6 were all of rifle caliber, while Ne111N-11 and N-16 only one of them was large-caliber. And in order to compensate for the loss of speed due to the increase in the weight of the machine, it was decided to install more powerful engines of the M-82 family on the IL-4 than the previous M-88B. According to the calculations of the designers of aircraft plant No. 23, which carried out this modernization, the maximum speed of the IL-4 with M-82NV engines, five UBTs and a crew of five people was to be 440 km / h; in any case, "silt" would not have yielded here to He!111N-6, N-11 and N-16, which developed no more than 434 km / h. 77.

However, "the disadvantages of the gear version [which was only suitable for installation on bombers. — A.S.] M-82NV and strong competition from the Tu-2 did not allow to complete the work "?? 8. We recall here that the M-82NV and M-82FN engines with direct fuel injection into the cylinders are the only reliable modifications of the M-82! - was not enough then not only for more

perfect than the Il-4, Tu-2, but also for the best Soviet La-5FN fighters ... Due to the failure to replace the engines, they abandoned the idea of re-equipping the Il-4 - and releasing them on combat missions on the same day they did not decide on the composition of the armament ... However, on the eve of the Battle of Kursk, the commander of the Red Army Air Force A.A. Novikov nevertheless obtained permission from I.V. Stalin to use one division during the day

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these machines - "as an experiment." From July 12 to the end of August 1943, this division - the 113th bomber division - as part of the 15th Air Army of the Bryansk Front, participated, making daytime sorties, in the Orel operation, and, according to Novikov, the experiment "succeeded"? 29. The facts, however, suggest otherwise. On the first day, E\190 from the 7th detachment of the 51st fighter squadron shot down an IL "right in front of" the escort fighters, and on July 13, the Fokkers of the same 3rd group of the Mölders squadron destroyed exactly a third of all those who flew for the IL-4 combat mission - 12 out of 36! In two days, for one irretrievable combat loss in the 113th division, there were only 9 sorties? 30. Having inflicted another blow on July 19, the division was then used to a limited extent, and in the first days of August, most sorties ... again made at night. Only, apparently, therefore, to the 14 vehicles shot down by fighters on July 12 and 13, only four more were added by August 15? 31. But after the resumption of sorties on the afternoon of August 24, a new defeat followed: E \ 190 from the same Mölders III group, as if in the 41st year, almost completely destroyed two nines from the 815th and 836th bomber regiments - shooting down each with 8 cars. Other Il-4 groups that flew to the area northeast of Bryansk did not meet with the Fokkers, but still, for one irretrievable combat loss in the division that day, there were only 4.25 sorties?32. "Fighting operations of IL-4 bombers during the day along the front line," summed up the division headquarters, "[...] were accompanied by significant combat losses of material and people, mainly from enemy fighters and partly from anti-aircraft artillery"?33.

Thus, the experiment confirmed that even with appropriate cover by fighters, it is extremely risky. And taking into account the insufficient training of pilots (accustomed to single sorties in the ADD, the pilots of the 113th division forgot how

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fly in formation? 34) and the insufficient training of fighter cover pilots - all the more ... In the 44th German

there were fewer fighters at the front, and more Soviet ones, on the contrary; the ability of the latter to cover attack aircraft also increased. But, apparently impressed by the heavy losses in the Oryol operation, the Soviet command did not dare to take any more risks.

It is not clear, however, why it was considered that the re-armed Il-4 would not be able to successfully fly during the day with the previous M-88B engines. In October 1942, Il-4 No. 2314, whose flight weight had increased by about 600 kg compared to the machines of the previous series due to an increase in fuel capacity, still developed a maximum speed of 404 km/h (at an altitude of 6650 m; according to other sources - 412 km / h at an altitude of 6600 m)? 35. Was it not possible to keep it at this level by increasing the mass of defensive weapons instead of the mass of gasoline (for a front-line bomber, the previous supply would have been enough)? The upper UBT on the IL-4 was already there, and to replace the ShKAS heavy machine gun on the lower MV-2 turret, install two more UBTs in "apples" along the sides of the fuselage, provide these three machine guns with the appropriate ammunition and introduce the fifth crew member of the reserve into 600 kg would have been enough... And 404 km/h, with good defensive armament and reliable fighter cover, would have been quite enough for a day bomber in 1943 so as not to suffer heavy losses. After all, the Germans used the entire 43rd year of the He111N-11, which even with unworn engines and without bombs (!) developed no more than 400 km / h, yielding to Il-4 No. 2314 in speed throughout the entire altitude range! 236 True, the Germans are better they knew how to fly in close formation, but four UBTs should still guarantee against a repetition of the air tragedies of the 41st and 43rd years ...

The delay in the saturation of front-line air units with Tu-2 aircraft was initially explained by the evacuation of the plant that mastered their construction from Moscow to Omsk and the complexity of this aircraft in production. Instead of September 1941, the serial production of the Tu-2 began only in March 1942 and unfolded very slowly. Then on the fate of the new

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The bomber was affected by the weakness of the Soviet fighter aircraft, which once again became very noticeable by the autumn of 1942. The difficulty of fighting the latest German B# 109C-2 forced them to take emergency measures to increase the production of fighters - in order to take the enemy at least in numbers .. Spending resources on the production of a new type of bomber in this situation was considered too great a luxury, and on October 7, 1942 [the State Defense Committee (GKO) ordered to stop building the Tu-2, and instead produce the Yak- 9. The degree of anxiety that seized the Soviet leadership that autumn is evidenced by an episode cited in the memoirs of the then people's commissar of the aviation industry A.I. Shakhurina. Knowing from the latest reports about the excellent qualities of the Tu-2, I.V. Stalin nevertheless

less than once angrily said:

- Why do not you give proposals for the removal of the aircraft from production? We really need fighters now"?37.

M. Pavlovsky names another reason for the termination of production of the Tu-2: because of the defects of the M-82 engines, it was "simply impossible" to fly on the new bombers?38. Indeed, it was not possible to bring this motor to the required degree of reliability on the Tu-2. True, on the machines that took place in September - October 1942, military tests on the Kalinin Front, there were already M-82NV with direct fuel injection - which, as a basic modification, did not suffer from the vagaries of the carburetor. However, another defect of the M-82 - the low reliability of the candles - was preserved in the M-82NV; created problems and the gearbox necessary for the use of this engine in bombers. An indirect confirmation of the version of M. Pavlovsky is the fact that, although the fundamental decision to resume the production of the Tu-2 was taken in the early spring of 1943, the corresponding resolution of the State Defense Committee was issued only on July 17, i.e. only after A.N. Tupolev managed to work out a new version of this machine - with much more reliable M-82FN engines ...

And then history repeated itself. who performed the post

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The GKO update of July 17, 1943, the Moscow aircraft plant No. 23 could not arrange the production of a complex aircraft in the required quantities. The absence of skilled workers who had gone to the front interfered, and the lack of the necessary machine equipment also interfered (it remained in Siberia, where the plant was evacuated in 1941 and from where it returned only in the spring of 1943). And the somehow built Tu-2s suffered from numerous defects ...

In general, the fate of the Tu-2 bomber was predetermined by two Achilles' heels of the Soviet aircraft industry of those years - a low production culture, which prevented the mastery of the construction of modern aircraft, and a chronic lack of powerful and at the same time reliable aircraft engines. However, no less pernicious role in the fate of this aircraft was played by one of the main vices of the Soviet leadership - "quantitative thinking". In the story of the Tu-2, it manifested itself not only in the fact that, due to many years of neglecting the quality of pilot training (see about this in the fourth section of Chapter II), the USSR would have to "fight in numbers" and spend resources on building from excess the number of fighters (after which there were not enough factories for bombers). Freeing up the enterprise to increase the production of fighters, the State Defense Committee could sacrifice not modern Tu-2s, but obsolete Il-4s - stopping the construction of the latter, say, on aircraft.

plant number 126. The only advantage of the IL-4 over the Tu-2 was a long flight range - but it mattered only during raids deep behind enemy lines (on Königsberg, Berlin, Budapest, etc.), and these raids during the course of the war did not say anything and were, in essence, purely propaganda actions ... However, the reduction in the already established production of the Il-4 would be compensated by the deployment of the construction of the Tu-2 far from immediately, and the general production of bombers in the USSR for some time is inevitable would have dropped. And the reduction in the number of all the years of the war was a kind of taboo for the Soviet leaders! It is characteristic that they did not dare to replace the Il-4 with the Tu-2 in production even in 1944, when the front line was significantly closer to the economic and political centers of the enemy and the huge range

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the flight of the Ilyushin machine finally lost its significance. |

As a result, the Soviet Air Force did not receive several thousand copies of the best of the Soviet front-line bombers of the war years, which in no way (with the exception of instrumentation and unstable dive behavior) was not inferior to the German machines, but in many respects surpassed them. Despite being smaller than L188 and Not! 11, flight weight (11,400-11,700 kg versus 12,500-15,000 kg²³⁹), the Tu-2 had the same bomb load - one and a half times superior to the A-20 and three times the Pe-2 ... If the Bostons "The maximum caliber of the bombs raised was equal to 250 kgau Pe-2 - 500 kg, then the Tupolev machine could carry 1000-kilogram bombs - and not on an external sling (as on 188 and He! 11), in the bomb bay! In terms of flight range, the Tu-2 was also at the level of the German bombers, almost doubling the Pe-2 here (2000-2200 km against 1200²⁴⁰). In terms of maximum speed, the Tu-2 model 1942 with M-82NV engines, which developed 521 km / h? 241 at an altitude of 3200 m, was inferior from all Soviet, German and Lend Lease bombers) only early - weakly armed and not with a large bomb load - "Boston". And the Tu-2S with M-82FN (547 km / h at an altitude of 5400 m? 42), which were produced from the end of 1943, outnumbered all the bombers used during the war years on the Soviet-German front! According to the crews, the layout of the Tu-2 defensive armament was also successful: as many as two rifle mounts for firing up and down (in the cockpit of the pilot and navigator and in the cockpit of the gunner-radio operator), one for firing down and back (in the cockpit arrow-radio operator) and two fixed barrels for firing forward? 43. True, the Tu-2s of the 1942 model were equipped only with low-power ShKASs, but on the Tu-2S, the rear hemisphere was already protected by three UBTs.

The Soviet Air Force could also use as a daytime front-line bomber one more aircraft with a significant (2000 kg, and in overload - 3000 kg²⁴⁴) bombing

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howling load - "North American B-25": in 1942-1945. did the USSR receive 861 such vehicles from the USA under Lend-Lease?"⁵. The maximum speed of the V-25S and O delivered in 1942-1943 was no less than that of the then Pe-2 (up to 490 km / h); in the B-257, which began to arrive in 1944, it decreased to 434 (according to other sources, 444) km / h? 246, those. approached the level of IL-4. However, the B-25 / (like the B-250-30) had incomparably more powerful defensive weapons than the "silt"; by Soviet standards, it was simply prohibitively powerful - eight 12.7-mm Colt-Browning machine guns! Three of them were located in the navigator's cockpit and fired forward, and five (sparks on the upper turret, one in the tail spinner and two in the side blisters) shot through the rear hemisphere; each of the rear installations (with the exception of the remote tail machine gun) was served by its own shooter. The only drawback of this weapon scheme was the presence of two - however, very narrow FIR - "dead zones" in the lower hemisphere?⁴⁷. The defensive armament of the V-25Si r (up to the O-30 series) was also powerful enough, on which four 12.7-mm machine guns defended the rear hemisphere: two on the upper turret and two on the lower. True, the lower installation had the same drawbacks as on the SB, DB-3, IL-4 and Pe-2: the shooter serving it could track the target only through a periscope sight with a very narrow field of view - and when the enemy aircraft was moving quickly lost sight of him for a long time. But, in any case, the V-25S and O were covered by no means weaker than the IL-4 and Pe-2, and "on the whole, the defensive weapons system received positive feedback from the flight crew"? It should also be taken into account that the control of the B-25 turrets was electrified and the shooters did not need to make significant efforts to deploy them. It is no coincidence that in the ADD "the relative losses of V-25s per one combat-ready aircraft in 1944 were 2.2 times lower than those of the IL-4, and American bombers were used more intensively than domestic ones"?⁴⁹.

The aerobatic qualities of the B-25 were also excellent: it was easy to control and stable in flight. And this, as already from

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It was noted that it made it easier for the pilot to keep the bomber on a combat course and, therefore, ensured greater accuracy of bombing from level flight than on the unstable and difficult to pilot Pe-2 and IL-4. (The bombsight, however, was the same as on them - OPB-1: from the USA, the B-25 came in general with the obsolete O-8.) And the take-off, landing, and flight on the B-25 were easier than on IL 4 (not to mention the Pe-2), and for an insufficiently trained average Soviet pilot, an American bomber

the driver turned out to be more accessible than domestic ones. Thanks to powerful and reliable engines, its reliability was also significantly higher (unlike the Il-4 and Pe-2, the V-25 flew freely on one engine). The survivability of the B25 airframe was excellent; already in the USSR, its gas tanks were equipped with a pressurization system with engine exhaust gases.

Nevertheless, in the daytime, the Soviet B-25s were actually used only in July-September 1942 and only in the 222nd Bomber Air Division of the 1st Air Army of the Western Front. Since October 42nd, all machines of this type were part of long-range aviation and, accordingly, they flew at night; there were very few exceptions (for example, the daytime strike of the 198th Guards Bomber Aviation Regiment of the 14th Guards Bomber Aviation Division of the 18th Air Army against Breslau on April 1, 1945). The fact is that the ADD command was tempted by the rather large flight range of the B-25; At the same time, the use of this aircraft as a daytime front-line bomber, according to the experience of the 222nd division, was recognized as inexpedient by the NIM. ".

This decision cannot be regarded otherwise than as erroneous. It is impossible to agree with V.R. Kotelnikov that the use of the V-25 only in long-range aviation was "quite logical" and that "for the role of a front-line bomber, the Pe-2 and A-20 were much better suited for us, and the ADD could be in to make full use of the large range of the B-25, and excellent navigational radio equipment, and powerful weapons, and a significant bomb load"250. Doesn't a front-line bomber need a "significant bomb load"? Did the "powerful armament" of the front-line bomber really need less

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better than the distant one, which flew at night and therefore did not meet German fighters so often? The fact that, as noted by V.R. Kotelnikov, according to all the above parameters, the B-25 "more corresponded to the distant Il-4 than to our front-line bombers" -? 7!, speaks only of the limited capabilities of these latter. After all, the V-25 corresponded here not only to the Il-4, but also to the L188 and Not! 11, those. the main `front-line bombers of the Luftwaffe! Not only in terms of bomb load, but also in terms of flight weight (12,900–16,000 kg versus 12,500–15,000 kg La88A and Ne111N), and dimensions (wingspan 20.58 m versus 20.08 m L188A-4 and 22 , 60 mu He! 11N-16; length 16.13 m against 14.36 m and 16.60 m, respectively), and in terms of flight range (in L188A-4 it was even more - 2730 km against 2150 km B-257) 252, it practically did not differ from these front-line bombers, and, we repeat, its more powerful armament for a front-line bomber cannot be considered a disadvantage ... It's just that the Red Army Air Force in 1942 (when the B-25 appeared in the USSR) did not know how to correctly use cars of this class in daytime conditions! B-25 in the 222nd division was used as if there was no bitter

experience of the summer of 1941 - they were released on combat missions in small groups (two and one by one!); These heavy and rather inert vehicles bombed the front line of the enemy from a low altitude... It is not surprising that the division then, in July-September of 1942, suffered significant losses. What is surprising is the complete rejection of any further attempts to use the B-25 as day bombers. Unlike the IL-4, for this they did not need to be re-armed or equipped with more powerful engines; all they needed was rational tactics and good fighter cover!

In general, the inertia of the Soviet command deprived daylight bomber aviation not only of the IL-4, but also of the B-25. More than 2,000 bombers with a good bomb load were artificially removed from combat work in daytime conditions (about 2,600 IL-4s were built from the beginning of 1943 to May 9, 1945) and up to 800 (B-25) - with an excellent one!

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Another bomber with a good bomb load (with M-105 engines - up to 2000 kg, with M-30B diesel engines - up to 4000-5000 kg! 254) - created under the leadership of V.G. Ermolaev Er-2 - really could not be used as a daytime front-line aircraft due to its excessive demands on airfields: the length of its takeoff run was at least 580 m. The lagging behind of the Soviet engine building again had an effect: on this largest of the Soviet twin-engine bombers (in terms of flight weight and dimensions it almost exactly corresponded to the He111N) it was necessary to install the same M-1065 engines as the light Pe-2 ... And with diesels M-30B, with which Er-2 was equipped at the end of 1943, the takeoff generally reached 810 m! and then - the benefit of their defensive armament was the same as that of the IL-4, and the speed was only a little more - they flew only at night, as part of long-range aviation.

As a result, V. Schwabedissen states, even in 1944-1945. the material part of the Soviet bomber aviation "did not fully correspond to the conditions of modern warfare." "This was one of the reasons why the results of the activities of the Soviet bomber aviation turned out to be limited"?57.

10. HOW EFFICIENT WAS THE NIGHT FRONT-LINE BOMBING AVIATION?

Functions of night front bomber aviation in the Soviet Air Force in 1942-1945. actually carried out by long-range bomber aviation (DBA), which on March 5

that 1942 was renamed into long-range aviation (ADD), and on December 6, 1944 - into the 18th air army. 80.6% of its sorties during the war years, she performed on targets located on the front line (40.4%) or in the tactical and operational depth of the enemy's defense

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(40.2%) - to troops on the battlefield, railway junctions, airfields ... 258 In addition, night light bomber aviation worked along the front line of the Germans.

Combat work of long-range aviation

Long-range bombers operating as front-line night bombers in a number of cases managed, according to the evidence of the enemy, to achieve serious successes. For example, in December 1942, they caused "a lot of trouble" to the airfields from which the German group encircled near Stalingrad was supplied; in 1943, active air strikes against the Dno station paralyzed the work of the most important railway line Vitebsk-Leningrad. In July 1943, during the German offensive on the Kursk Bulge, "night bombing attacks on the most important railway junctions and transport communications led to long delays in the supply of ammunition, equipment, food and other supplies." "Very sensitive", according to the former commander of the 215th infantry division of the Wehrmacht, Franke Witz, were the bombing of the positions of the 18th Army of the Germans during the Minsk operation, July 29 - August 12, 1943 in 1944-1945, indicates W. Schwabedissen, the results of the ADD night strikes "were different, but in general they became more and more effective"?59.

However, it follows from the text of W. Schwabedissen's work that the Germans' relatively low final assessment of the effectiveness of the actions of Soviet night bombers (even in 1944-1945 "the results obtained did not correspond to the efforts made"260) applies not only to night light bomber aviation (which only exhausted the enemy shaft without causing him any noticeable material damage), noik ADD.

V. Schwabedissen sees the reasons for the insufficient effectiveness of the combat work of Soviet night bombers in the "poor training of the flight personnel and lack of

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sharp combat practice, as well as untried tactics ke"261. The first of these shortcomings was, however, characteristic

ren is more likely for night light bomber aviation than for long-range. "Analysis of archival documents," note A.N. . The transfer of long-range bombers at the end of 1941 to operations exclusively at night reduced their combat losses by several times. For example, in 1943, one bomber irretrievably lost for combat reasons in the ADD accounted for at least 150 sorties (more than 500 crews died in about 75,000 sorties) - while in the Red Army Air Force (i.e., in front military aviation) in August 1942 - May 1943 - a total of 48263. In 1944, in the 34th Guards Long-Range Aviation Regiment of the 4th Guards Long-Range Aviation Division, this ratio was already 1: 546! 264 As a result, even after terrible losses 41st year, even after the death of 506 crews in the 43rd Airborne Division, "it was possible to maintain the core of pilots and navigators. Some of them had pre-war experience of serving in long-range bomber aviation units, others had thousands of hours of flying time in the Civil Air Fleet... 265 front-line aviation, time for their preparation. For example, Senior Lieutenant A.S. Mogilnitsky in the 22nd Guards Long-Range Aviation Regiment of the 5th Guards Long-Range Aviation Division was trained for combat work on the B-25 for three and a half months - from November 3, 1943 to February 17 1944 ("Exercise No. 2-5 flights, exercise No. 3-3 flights", etc., etc. "266). And this despite the fact that an easy-to-fly V-25 pilot "could learn in a few days," and Mogilnitsky had been flying since 1938 and managed to make (albeit on a light U-2) 115 sorties? And the navigator of the 18th Guards Long-Range Aviation Regiment of the 2nd Guards Long-Range Aviation Division V.T.

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at the end of 1943, only in the ADD flight center in Moni, he flew about 70 hours? 68, and behind him was the 1st Higher School of Navigators and Pilots in Karshi, and training in Semipalatinsk ...

In any case, the insufficiency of crew training in the ADD should not have been felt to such an extent that it would explain the insufficient effectiveness of the combat work of long-range aviation. |

The same must be said about the "insufficiency of combat practice." At least in 1943-1945. the crews that had flown since the beginning of the war (and, as we have seen, there are quite a few of them in the ADD), the experience of night bombing strikes should already have been solid. Describing the German pilots who bombed Moscow in the summer of 1941, D.B. Khazanov considers 77, 79 and 101 night sorties, respectively

G. Moriha, A. Reinhard and 3. Röthke from the 4th bomber squadron, very significant experience? 69. However, by the beginning of the 43rd, 70-80 night sorties should have been recruited from very many ADD pilots and navigators. After all, from the beginning of 1942, long-range aviation flew almost exclusively at night, and the average intensity of the combat work of the crew in it was equal to 7-8 sorties per month. Thus, S.S.Sugak from the 7th long-range air regiment of the 53rd long-range air division accumulated 76 night sorties in 11 months (from July 1, 1941 to June 1942). His brother-soldier L.N. Ageev, who began fighting at the same time with him, in December 1942 (that is, after about 17 months of combat work) had 114 sorties at night, by April 1943 (after 21 months) - 143, by August (after 25 months) - 185, i.e. constantly flew with an average intensity of 7 sorties per month; Ageev's final account - 222 night sorties for 28 months (July 1941 - October 1943) - gives us an average figure of 8 sorties per month. A.V.Dudakov from the 125th Long-Range Air Regiment of the 4th Guards Long-Range Air Division (later - the 15th Guards Regiment of the same division, and in 1945 - the 198th Guards Bomber Aviation Regiment (long-range) of the 14th Guards Bomber Aviation Division), which committed from September 15, 1942 to the end

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war (i.e. in 31.5 months) 220 sorties - almost all at night. Heroes of the Soviet Union S.I. Kretov, A.I. Molodchiy, V.N. Osipov, V.V. 400, 311, about 400, 430 and 386 sorties in 46.5 months). A.S. Mogilnitsky, who fought first in the 22nd Guards, and then in the 337th (in 1945 - the 251st Guards Bomber Aviation Regiment (long-range) long-range air regiments of the 5th Guards Long-Range Air Division (in 1945 - 15th Guards Bomber Air Division) and made 86 sorties from February 18, 1944 until the end of the war, the figure we are interested in turns out to be 6 ... 270 Nov 1942-1943 experience could accumulate much faster! For example, the already mentioned V.N. Osipov from March 1942 to November 1943 flew in the 5th Guards Long-Range Aviation Regiment of the 50th Long-Range Air Division with an average intensity of 13 night sorties per month (267 in 20 months) From November 1941 to January 1943, navigator V.V. In March 1943, he made 26 sorties, and in July 1943 the 1st Guards Long-Range Air Division scored 25-30 sorties from as many as 10 crews ...? 71

Of course, the newly trained crews did not have enough combat experience at first - for example, they were inclined

not to look for targets, but to bomb "on the seats of fires" caused by the strikes of already bombed aircraft. This more than once led to a decrease in the effectiveness of the strike - for example, during the bombing of the German airfield Baranovichi or the railway station Orsha?⁷². "The accuracy of bombing, of course, is relative," admits D.P. Vaulin, who flew the Pe-8 and V-25 in the 890th long-range air regiment. - Sometimes they said: "We bombed on the boot"⁷³. Apparently, the low accuracy of bombing during attacks on German headquarters in Szombathely, Veszprem, Pape, Sopron and others, personally testified by V. Schwabedissen, should also be attributed to the insufficient experience of the crews.

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Hungarian cities in late 1944-early 1945²⁷⁴ (after all, they bombed, apparently, B-25s from the 4th Guards Long-Range Air Corps, whose excellent radio navigation equipment made it possible to accurately reach the target). And yet, "lack of combat practice" was clearly not the main defect of Soviet long-range aviation ... More important, apparently, was something else: more trained and more experienced than front-line aviation pilots, ADD pilots - "by general [! - A.S.] in the opinion of the German officers"⁷⁵ - they also showed great concern for their lives. "The crews of the bombers performing night combat missions," notes V. Schwabedissen, "did not burn with enthusiasm and, at the slightest danger of being caught by a searchlight beam or attacked by German fighters, dropped bombs anywhere"; "there can be no doubt that the pilots of the short-range bomber [i.e. frontline. - A.S.] aircraft during attacks on frontline ground targets were more aggressive than their counterparts from the ADD"²⁷⁶. And indeed, on the map of the routes of the ADD bombers that attacked Helsinki on the night of February 27, 1944, compiled according to reports from Finnish observation posts, it is clearly seen that almost all aircraft turned away before reaching the city (and, apparently, dropped bombs in Gulf of Finland)⁷⁷. According to the former pilot of the 54th Luftwaffe Fighter Squadron O.Kat, the zero effectiveness of the strikes of the I-th bomber air corps of the DBA on the crossings across the Western Dvina near Dvinsk that he observed on June 27, 1941 was caused by "haste and nervousness during bombing"? ⁸. Is it a coincidence that the only case mentioned in the work of D.B. Khazanov about the air war over Ukraine in June-September 1941 was the case of premature dropping of bombs by Soviet bombers (most of the 66 bombers that flew on July 10, 1941 in the areas of Zhytomyr and Berdichev DB -ZF of the 18th and 22nd bomber air divisions? ⁷⁷) is associated specifically with the DBA? Finally, how to explain that, having completed more than 1500 aircraft sorties on June 5-26, 1943 to bomb German airfields in the Oryol ledge, ADD not only destroyed only 5 (of which only two bombers) and damaged only 6-7

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German aircraft, but was unable to disrupt the raids carried out at that time from these airfields on the industrial centers of the Volga region (i.e., failed to destroy the airfield infrastructure)?⁸⁰

An important role was also played by the imperfection of the tactics of long-range bombers, which acted as night front-line bombers, noted by W. Schwabedissen. Suffice it to say that until the summer of 1943 their strikes were carried out exclusively by single aircraft (!) or in small groups - and only after that sorties by one or two squadrons began to be practiced more and more often. Naturally, the power of the strike turned out to be insufficient... And the fact that the ADD planes "surprisingly", as the Germans noted, "consistently chose the same route of approach to the target and departure from it"⁸¹, significantly facilitated the actions German fighters and anti-aircraft gunners (the extra losses suffered by the Soviet bombers as a result just allowed the enemy to draw the conclusion we have already quoted about the discrepancy between the results of the strike and the efforts expended) ... These routes, however, were "lowered" by crews from headquarters. In general, the tactical vices of the ADD were due primarily to the miscalculations of its command. Crews, for example, were often prevented from properly preparing for a task by declaring the task to them only a few hours before the start. Not having time to properly study the route and organization of the enemy's air defense, the crews in a number of cases disrupted the task?⁸².

The effectiveness of the combat work of long-range aviation was also reduced by the imperfection of its material part - characteristic, according to the above assessment of V. Schwabedissen, for the entire Soviet bomber aviation ...

First of all, attention is drawn to the relative weakness of the bomb salvo of the ADD - 18th Air Army. Thus, in [1943] its bombers, having made almost 75,000 sorties, dropped only slightly more than 78,000 tons of bombs?⁸³, i.e. the average bomb load of an aircraft flying on a combat mission was only about 1050 kg. But in the 43rd ADD, the main aircraft was the Il-4, theoretically capable of lifting up to 2500 kg of bombs. Based at the Monino airfield near Moscow

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The 728th long-range air regiment Il-4, flying near Rzhev, Smolensk, Orel, took on board 1500-1750 kg in the 98th, using the jump airfield, they even flew to Berlin with one and a half tons of bombs!⁸⁴ In addition to the "silt", V-25s were used, the standard bomb load of which in the 15th Guards and 890th long-range air regiments was 2000 kg; in the 362nd long-range air regiment (though already in [1945] even 2500 kg. Until August 1943, four

motorized TB-3s, carrying up to 2,500 kg, and several dozen four-engined Pe-8s, lifting up to 4,500–5,000 kg (and, according to some sources, up to 6,000–7,000 kg)⁸⁵. And only no more than 30% of the aircraft fleet of the ADD - or only by the end of the year - were Li-2s with a bomb load of 1000-2000 kg⁸⁶. On the other hand, long-range raids - forcing to take more fuel by reducing the bomb load - in [1943] accounted for only an absolute minority of ADD sorties ...

However, long-range aircraft were badly worn out. Since in 1942-1945. ADD - The 18th Air Army suffered significantly fewer losses than front-line aviation, the bomber was operated in it, as a rule, much longer. And after several hundred landings, the glider of the same Il-4 "did not allow significant overloads"⁸⁷. The depreciation of the engines of many bombers also had an effect: due to the general backwardness of the Soviet engine building, parts of long-range aviation were supplied with engines unsatisfactorily even in 1944. The importance of the wear and tear of the airframe and engines is clearly seen in the example of the attempt by the DB-3 group of the 1st mine-torpedo regiment of the 8th bomber air brigade of the Air Force of the Baltic Fleet to strike Pärnu on August 5, 194]. Although the distance from the Cahul airfield on the island of Ezel (Saaremaa) to the target was only 130 (!) Km, and the passport maximum bomb load of the DB-3 was 2500 kg, the vehicles that had been in operation for a long time could not get off the ground even with 1500 kg bombs⁸⁸. In the same way, the characteristics of the IL-4 remained only on paper. Starting on the night of February 7, 1944 from the Torzhok airfield on Helsinki - the distance to which was (in a straight line) about 700 km - the "silts" of the 8th air corps of the ADD had on board

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on average, only 1131 kg of bombs⁸⁹. Theoretically, the IL-4, produced in 1943, should have carried 1000 kg of bombs only if it was going to cover the distance as much as 3585 (at an average ground speed of 340 km / h) - 4265 (at 250 km / h) km! 290 But For example, in the 455th long-range air regiment of the 48th long-range air division of the 8th corps, only one aircraft, distinguished by the excellent quality of the airframe and engines, was able to lift the passport maximum bomb load of an aircraft of this type - 2500 kg. And the "silts" of the 2nd Guards Air Corps of the ADD - which from Luga to Helsinki could fly only about 300 km! - on that evening of February 6, 1944, they were forced to take on board an average of not 2500 or even 2000, but only 1232 kg of bombs ... 27! |

Since the end of 1942, another factor has also worked to reduce the average bomb load of a long-range bomber - the continuous increase in the share of the Li-2 machine in its aircraft fleet. This impromptu bomber - a modification of the Li-2 cargo-passenger aircraft - could carry only 1000-2000 kg of bombs (on the outer

suspension)? 32, but by the end of the war it became the most common aircraft in the 8th Air Army. At the same time, in August 1943, the last few dozen TB-3s were withdrawn from the combat strength of long-range aviation; in June 1944, production was stopped, and in October the combat use of the Pe-8s, which had an even more powerful bomb salvo. TB-3s could no longer be operated: not only the aircraft of this type, but also the M-17F, M-34 and M-34R engines that were on them, and most importantly, spare parts for the engines, were removed from production long ago. The rejection of the Petlyakovs-8 was, apparently, caused by hopes that the more advanced American heavy bombers Consolidated B-24 "Liberator" would soon receive under Lend-Lease: just in June 44, the crews of the Pe-8 flying The 45th long-range air division began to retrain on the B-24. Hopes, however, did not come true: although in November 1944 the Americans promised to supply 200 Liberators to the USSR, not a single machine of this type was received ...

One way or another, the ADD aircraft that bombed Helsinki on the night of February 7, 1944 had an average bomb load

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equaled only 1270 kg (728 Il-4, Li-2, V-25 and Pe-8 then dropped 924.9 tons of bombs)? 3. Meanwhile, the German L188 and Not! 11, carrying out 5, 6, Ti June 8, 1943, similar long-range night raids on Gorky, carried an average of 1455 kg of bombs, and inflicting 0 and 21 June night strikes on Yaroslavl - 1624 kg each. At the same time, 20 "Heinkels" bombing Gorky on the night of June 8, the average bomb load was 1950 kg²³⁴. During the daytime strike of the 18th Air Army on Königsberg on April 7, 1945, 514 sorties accounted for only 550 tons of bombs dropped; during the bombing by parts of the 18th air German positions on the Seelow Heights near Berlin on the night of April 17 - 931 tons for 759 sorties; during an attack on the southwestern outskirts of Berlin on the night of April 26, 1945 - 569.2 tons for 517 sorties⁹⁵. Thus, the average bomb load of a long-range bomber in these last operations of the war was only about 1070, 1230 and 1100 kg, respectively - only slightly exceeding the maximum bomb load of the converted Pe-2 fighter ...

Another weakness of long-range bombers (with the exception of the American B-25) was the imperfection of their instrumentation. The industry was never able to establish the production of radio altimeters for the IL-4, and produced so few radio semi-compasses that the aircraft factory No. 39 put them only on every third "silt", and factory No. 18 - on every fifth⁹⁶. Until the end of 1942, only 100 of the approximately two thousand IL-4s produced by that time were able to be equipped with a blind landing system, and only about 60 with an autopilot⁹⁷, which was especially necessary for this very difficult aircraft to fly. According to the testimony of one who fought on the IL-4 in the 748th long-range aviation regiment

the actions of A.I. Molodchiy, the long-term piloting of this (until the end of 1942 still unstable) machine so tired the pilots that they sometimes made mistakes that led to death ... Only from the middle of 1943 - and only for waiting for the second plane - they began to install on the IL-4 and a course machine. On the German bombers, this last one, and the radio compass (and not "semi-", but automatic), and the equipment for blind landing were still available.

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before the war... Li-2's navigational equipment was also quite meager: although this aircraft was a licensed reproduction of the American Douglas OS-3, Soviet instruments were installed on it. "The Li-2 radio operators could only lick their lips, looking at what their colleagues had on American vehicles [C-47 transport vehicles, which were a modification of the OS-3. - A.S.]: three different radio stations, a radio altimeter, a blind landing kit, an automatic radio compass. "The set of instruments was not only much richer, they were also more accurate and reliable, they had a longer resource"?38. Apparently, it was precisely the imperfection of navigation equipment (and not the lack of training among pilots and navigators) that was the main reason why long-range bombers flew, as the Germans note, "only in favorable weather", "only on lunar or clear starry nights". but chi" - and therefore suffered unnecessary losses from the attacks of German night fighters? 99.

Combat work of
night light bomber aviation

Night light bomber aviation was equipped with aircraft of a completely different class than daytime frontal bomber and long-range bomber aircraft. These were single-engine double biplanes - mainly U-2VS (U-2 training aircraft adapted for lifting 350 kg of bombs; from August 1944, after the death of their designer N.N. Polikarpov, they were called Po-2VS), and in 1941-1942 also R-5, SSS and R-Zet (light bombers and attack aircraft, which began to enter the air units in 1931, 1935 and 1936, respectively, and could carry up to 500 kg of bombs)309. Huge numbers of these biplanes hung at night over German lines throughout the war, dropping bombs on any targets they could find. This greatly exhausted the enemy, however, according to the unanimous assessment of the Wehrmacht officers, the material damage from these bombings was insignificant? 01. On the one hand, the low bombing heights and extremely low speed of the U-2 (with bombs - no more than 135 km / h302) worked at a reduced

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bombs and, accordingly, increased the accuracy of bombing, but, on the other hand, were affected by the imperfection of sights and navigation equipment and, apparently, insufficient training of pilots and navigators. "The officers of the Luftwaffe and the army," testifies, in any case, W. Schwabedissen, "think that if the training of Russian crews were at a higher level, and the equipment for performing night flights was perfect, the results of these raids could be more weighty."

11. CONCLUSION

On the whole, the actions of Soviet bomber aviation on the Soviet-German front should be recognized as not sufficiently effective. Despite the continuous growth of its numbers, even in 1944-1945, as German front-line officers testify, "on the whole, the losses suffered by the German army from Soviet air strikes remained within acceptable limits. The troops found opportunities to carry out the necessary movements even in the daytime in fairly large formations. The losses in this case were not so great. And this despite the fact that attacks on the enemy were carried out not only by bombers, but also by attack aircraft - as well as fighters, which often performed the functions of the latter!

Among the reasons that reduced the effectiveness of the combat work of Soviet bombers, the first place should be given to the lack of training of their crews, which primarily determined the low accuracy of bombing. Throughout the war, a significant (if not a large) part of the Soviet navigators did not aim on their own, but dropped bombs on a signal from the leading aircraft. For most of the war, the bulk of the pilots were not able to realize the main advantage of the main Soviet front-line bomber of the Pe-2 war years - the possibility of dive bombing, which dramatically increased the accuracy of the strike ... With the exception of the ADD, the result of insufficient training of bomber pilots was this - hushed up in Soviet times, but nonetheless widespread - a phenomenon

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as a refusal to perform a combat mission in a collision with strong air defense. Poor crew training also led to unnecessarily high losses from fighter attacks and anti-aircraft fire, which also reduced the efficiency of Soviet bomber aviation.

The second of the main reasons for the insufficient effectiveness of the actions of Soviet bomber aviation was the imperfection of its materiel. First of all

this is the weakness of a bomb salvo. Throughout the war, most of the Soviet bombers (first SBi Su-2, and then Pe-2 and U-2VS) had an insufficient bomb load; the maximum caliber of the bombs they used was also insufficient. In addition, most of the Soviet bombers (Pe-2, and until 1943 and DB-3F (IL-4) were distinguished by unsatisfactory piloting qualities - which not only made it difficult for pilots to master the machines (as a sin, poorly trained!), but also worsened the accuracy of bombing. The obsolete Soviet bombsights also had a negative effect on this latter (we recall that they were also on bombers received under Lend-Lease from the USA). use of [Soviet. - A.S. | aviation day and night, the protection of aircraft from air defense systems," V.M. Zaretsky directly points out, "could be an order of magnitude higher if more advanced aiming and navigation systems "3b5. According to all the above criteria, Soviet bombers were significantly inferior to the German ones - L188 and He1 11.

It is impossible not to point out in this connection the exaggeration by Soviet authors of the merits of the Pe-2, the main Soviet bomber of the war years. The "high speed" of this aircraft, extolled in Soviet literature, was by no means high during most of the war (mainly due to the poor quality construction of the machines). And in other periods, she practically did not help the "pawns" in battles with German fighters - the speed of which was invariably much higher ... And for a number of others - the most important for a bomber! - parameters

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Pe-2 was simply unsatisfactory. The insufficiency of its bomb load was recognized even in Soviet literature³⁰⁶; the flight range and (due to too little power reserve of the engines) reliability were also insufficient. The complexity of the Pe-2 in piloting, in essence, deprived this machine of its main advantage - the ability to deliver high-precision strikes from a dive (yes, by the way, it can also hit a target from a horizontal flight). "Calculations show that under typical conditions of battles on the eastern front" when bombing from level flight at an "areal weakly protected target", the Pe-2 turned out to be [.7 times less effective than one of the two main German bomber aircraft — Li88 (in the modification of 1941-1943, A-4). And when bombing from a dive on "small-sized hard-to-reach targets" - approximately 1.1 times³⁹⁷. And this is clearly under the condition of the same level of crew training! And since these last ones in the Soviet Air Force throughout the war were worse prepared than in the Luftwaffe, the real superiority of the L188 over the Pe-2 in terms of combat effectiveness should have been even greater.

In general, the Soviet leadership made a number of serious miscalculations when forming the aircraft fleet for daytime frontline bomber aviation. In particular, it is impossible to justify his abandonment of the idea of using during the day much more powerful than the Pe-2, the Il-4 and V-25 aircraft, as well as the continuation of the production of Ar-2 dive bombers - whose effectiveness in defeating "small-sized hard-to-vulnerable targets" was 1.4 times higher than that of the Pe-2 (and even 1.3 times higher than that of the L188A-4!), and when working on an "areal weakly protected target" - 1.3 times³⁶⁸, but which no less still in February 1941 was discontinued.

The third of the main reasons for the insufficient effectiveness of the combat work of Soviet bomber aviation must be recognized as the imperfection of its tactics. The practice of striking with small forces, the imperfect battle formations of groups, the stereotyped actions that allowed the Germans to more effectively counter Soviet bombers - all this was rooted as in the weakness of training

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crews, and in the lack of training of Soviet aviation commanders.

As in other branches of Soviet aviation, in 1944-1945. the aforementioned vices began to be eliminated. The quality of the crews' bomber training improved somewhat; the bomb salvo of the daytime front-line bomber aviation increased somewhat due to the increase in the share of Lend-Lease vehicles A-20V C in its aircraft fleet; For combat missions, bombers began to fly more often in large groups and in improved combat formations. However, until the end of the war, Soviet bomber aviation was not able to completely eliminate its inherent shortcomings; moreover, she was just beginning to overcome them ...

Ultimately, these vices, like the vices of other branches of Soviet aviation, were the result of the fundamental defects of the Soviet socio-political system, Soviet ideology and the Soviet economy. Thus, the gigantomania inherent in the Soviet leadership, "quantitative" thinking, did not allow to increase the training time for crews (while sacrificing the total number of trained ones). To a large extent, due to such thinking, it was not possible to saturate the daytime front-line bomber aviation with aircraft modern for those years with a solid bomb load (Tu-2). After all, mastering the production of a new machine would inevitably reduce at first the overall figure for the production of bombers (and in the case of the Tu-2, fighters)! However, to ensure the high-quality manufacture of bomb carriers that meet the requirements of the Second World War - two- and multi-engine all-metal vehicles, saturated with automatic

devices, radio devices, widely electrified - even Soviet industry could not. Here, such misfortunes as the backlog of the engine and instrumentation and the low culture of production in aircraft construction appeared again - due, in turn, to the weakness of the scientific and experimental base, lack of technical experience and low qualifications of the bulk of the workforce - in general, the youth of the domestic industry compared to Western industry.

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Notes

1 World War. 1939-1945. M.; SPb., 2000. S. 629.

2 Calculated according to: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. T. 1. Harsh school. M. 2003. S. 184-185; Medved A.N., Khazanov D.B. "Paper Tiger" of the Red Army Air Force // Aviation and Time. 1996. No. 4. S. 11; Medved A. Soviet reconnaissance aviation in the initial period of the war // Aviation. No. 8. M., 2000. S. 20. As of June 1, 1941, there were 3759 SB, 309 Su-2, 177 Pe-2, 162 Yak-2 and Yak-4 and 160 Ar-2. Machines of these types (with the exception of about 250 SBi 84 Yak-2 and Yak-4, which served in reconnaissance aviation) formed the fleet of front-line bomber aviation. According to other sources, the share of SB in this fleet was then 70% (Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.M., 1999. P. 16).

3 Calculated according to: Perov V.I., Rastrenin O.V. Assault aircraft of the Red Army. pp. 184-185. In the composition of long-range bomber aviation, we also include air units equipped with TB-3 - which were listed as transport units, but with the outbreak of war they again began to be used as bombers. Taking them into account, long-range bomber aviation had 1066 DB-3, 1055 DB-ZF, 452 TB-3, 11TB-7Ti5 DBA as of June 1, 1941.

4 Shvabedissen V. Stalin's falcons. Analysis of the actions of Soviet aviation in 1941-1945. Mn., 2001. S. 104, 111, 112.

5 Geyer G. Harmey Corps in the Eastern Campaign of 1941 // From the Bug to the Caucasus. M., 2004. S. 75, 97.

6 Raus E. Tank battles on the Eastern Front. M. 2005. S. 83.

7 Anfilov V.A. The collapse of Hitler's campaign against Moscow. 1941. M., 1989. S. 172.

8 Shvabedissen V. Decree. op. pp. 112-113.

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10 Calculated according to: Morozov M. Entered into immortality // Aviamaster. 2002. No. 2. S. 14.

- 11 E. Manstein, background. Lost victories. Rostov n / a., 1999. S. 192.
- 12 Shvabedissen V. Decree. op. S. 108.
- 13 Simonov K. One Hundred Days of War. Smolensk, 1999. S. 337-338.
- 14 Guderian G. Memoirs of a soldier. Smolensk, 2001. P. 219.
- 15 Calculated according to: Khazanov D. Werner Molders // Aviamaster. 1997. No. 4-5. S. 30.
- 16 Morozov M. Entered into immortality. S. 14.
- 17 Schwabedissen V. Decree. op. S. 107.
- 18 Archipenko F.F. Notes of a fighter pilot. M., 1999. S. 36.
- 19 Novikov A.A. In the sky of Leningrad. From the notes of the commander of aviation
her // War, aviation, life... To the 100th anniversary of the Chief Marshal of Aviation A.A. Novikov.
M., 2000.S. 220.
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- 20 Medved A.N., Khazanov D.B. Unknown Pe-3 // Aviation and Time. 1995. No. 4. P. 9: Maslov M.
I-153. M., 2001.S. 40.
- 21 Ratkin V. Vitaly Aleksandrovich Gordilovskiy // World of Aviation. 1995. No. 1. S. 19;
Khazanov D.B. 1941. War in the air. Bitter lessons. M., 2006. S. 111; Egorov D.N. June 41st. Defeat
of the Western Front. M., 2008. S. 154.
- 22 Gulyas I.A. Fragments of the combat use of IL-4 // Aviation and Time. 1998. No. 1.S. 16-17.
- 23 See: Ratkin V. Combat friends // World of Aviation. 1994. No. 1.S. 24, 29. The author indicates that
the regiment suffered these losses in five months, but from the further presentation it is clear that
we should be talking about five weeks
lyakh.
- 24 Gulyas I.A. Decree. op. P. 18. 25
Shvabedissen V. Decree. op. S. 120.
- 26 Khazanov D. Werner Molders. P. 30: Onge. 1941. War in the air. Bitter lessons. pp. 347-348.
- 27 Khazanov D.B. 1941. War in the air. Bitter lessons. pp. 312-313, 315, 326-327.

28]] vabedissen V. Decree. op. pp. 114-115.

29 Calculated by: Khazanov D. Werner Melders. P. 30: Morozov M. Walking into immortality. S. 14.

30 Perov V., Rastrenin O. Shturmovik IL-2 // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2001. No. 5-6. S. 101; Gordyukov N.T., Khazanov D.B. Close bomber Su-2. M., 2000. S. 59.

31 Winter War 1939-1940. Book. 2. I.V. Stalin's Finnish campaign. (Transcript of the meeting at the Central Committee of the All-Union Communist Party of Bolsheviks). M., 1998.S.95.

32 Gordyukov N.T., Khazanov D.B. Decree. op. S. 33; Rodionov I.I., Sovenko A.Yu.II-4: so it was // Aviation and Time. 1998. No. 1. S. 13.

33 Op. by: Rodionov I.I., Sovenko A.Yu. Decree. op. S. 12.

34 Op. by: Sobolev D.A., Khazanov D.B. Command trace in the history of domestic aviation. M., 2000. S. 158.

35 Komal F.B. Military personnel on the eve of the war // NO TOIC magazine. 1990. No. 2.S. 26.

ZbRussian archive. The Great Patriotic War. T. 13 (2-1). M., 1994. pp. 266-267. |

37 Winter War 1939-1940. Book 2. S. 115.

38 Shvabedissen V. Decree. op. S. 106.

39 Ibid. S. 1065.

40 Ibid.

41 Aircraft building in the USSR 1917-1945. Book. |. M., 1992. pp. 232, 240.

42 Ibid. S. 346; Rodionov I.I., Sovenko A.Yu. Decree. op. Tab (brief technical description of the II-4 long-range bomber); Frost S. Winged Cruiser of the Empire // Aviation Review. Issue 6. Kharkov, 1997. S. 12-13, tab.

43 Morozov M. Entered into immortality. pp.7-8, 14.

44 Kotelnikov V. Illegitimate bomber // History of Aviation. 2001. No. 3. S. 19.

45 Aircraft building in the USSR 1917-1945. Book 1.S. 238-239.

46 He-111. M., 1996. P.56.

47 See: Shvabedissen V. Decree. op. pp. 118-119.

48 Bolotin D.N. Soviet small arms. M., 1990. S. 298; Gordyukov N.T., Khazanov D.B. Close bomber Su-2. S. 54.

49 Kotelnikov V. "Katyushki" in the country "X" // Aviamaster. 2002. No. 6. P. 23.

50 Markovsky V., Medved A. Weapon "pawn" // Aviamaster. 1997. No. 2. S. 26.

51 Op. Quoted from: Ionov E. "From that moment, the count of time and the limit of physical and moral stress was lost ...". The history of combat operations of the 62nd Bomber Air Division of the Air Force of the 5th Army of the South-Western Front // World of Aviation. 2003. No. 2. P. 14. The number of SBs in the 52nd 94th regiments was calculated according to: Ibid. pp. 11-12. According to other sources, on June 22, 1941, these two regiments had 84 SBs (Report on the combat operations of the air forces of the Southwestern Front for the period from 22.6 to 10.8.41 (for fifty days of the war) // Military Historical archive, 2002, No. 9, p. 157).

52 He-111.S. 10-13, 24.

53 Schwabedissen V. Decree. op. S. 119.

54 See: Siropiaakh. Once again on the extraordinary luck of Jormo Sarvanto // History of Aviation. 2000. No. 4. pp. 19-20.

55 Cited. by: SpeakM. Aces of the Luftwaffe. Smolensk, 1999, p. 141.

56 Schwabedissen V. Decree. op. S. 119.

57 N.A. Gunbin, who flew in 1941 as a navigator in the 220th long-range bomber regiment, now considers the defensive armament of the DB-3 to be sufficient. However, he motivates this opinion only with unconfirmed information about the shooting down of three fighters by his crew in one sortie (Drabkin A.Ya fought on a bomber. M., 2010, p. 156).

58 He-111.S. 56; Aircraft building in the USSR 1917-1945 Book. 1.C. 346, 349; Rodionov I.I., Sovenko A.Yu. Decree. op. Tab (tactical and technical characteristics of Il-4 bomber variants).

59 Ibid.

60 Gulyas I.A. Decree. op. S. 17.

61 Novikov A.A. Decree. op. S. 180.

62 Khazanov D.B. Unknown battle in the skies of Moscow. 1941-1942 defensive period. S. 52.

63 Sh/vabedissen V. Decree. op. S. 110.

64 See: Ratkin V. Hero of the Soviet Union N.I. Gapeyonok // World of Aviation. 1996. No. 2.S. 12.

65 Op. Quoted from: Khazanov D.B. Invasion. The beginning of the air war on the Soviet-German front // Aviation and Time. 1996. No. 4.S.30.

66 Gordyukov N.T., Khazanov D.B. Decree. op. S. 53.

67 Ibid. pp. 46-47.

68 Gordyukov N.T., Khazanov D.B. Decree. op. S. 43.

69 Ibid. S. 80.

70 Khazanov D.B. Battle for the sky. 1941. From the Dnieper to the Gulf of Finland. M., 2007. S. 93.

71 Gordyukov N.T., Khazanov D.B. Decree. op. S. 60.

72 Gordyukov N.T., Khazanov D.B. Decree. op. pp. 40-41, 43-45.

73 Ibid. S. 85.

74 Gordyukov N.T., Khazanov D.B. Decree. op. S. 46.

75 Op. Quoted from: Suvorov V.Den-M. When did World War II start? M., 1994. S. 106.

76 By the spring of 1943, there were about 400 "Bostons" on the fronts;; in the only bomber air unit of the operating fleets equipped with these machines - the 36th bomber air regiment of the Air Force of the Black Sea Fleet - there should have been about 20 of them (Kotelnikov V.R., Petrov G.F., Sobolev D.A., Yakubovich N.V. Americans in Russia, Moscow, 1999, pp. 104, 106). "Pawns" in the active army and the reserve of the High Command of the Red Army, even by July 1, 1943, there were 853 (Medved A.N., Khazanov D.B. Pe-2 diving bomber. "Pawn", which became a queen. M., 2007 153). We judge the ratio of the number of Pe-2s and Bostons in the Air Force of the active army and navy in 1944 by their ratio without return losses this year - when 517 "Pawns" and 166 "Bostons" were decommissioned (calculated according to: Alekseenko V. Soviet Air Forces on the Eve and During the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow ... 2000. No. 3. P. 8). As shown in the Boston section of this chapter, the loss rates for both the Pe-2s and the Pe-2s were almost the same.

77 Schwabedissen V. Decree. op. pp. 210, 202.

78 Ibid. P.203. —

7E Ibid. P.306.

80 Ibid. S. 312, 322.

81 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1. M., 1999. S. 33. yy

82 | Avrov VB History of aircraft designs in the USSR. 1938-1950 (Materials of the history of aircraft construction). M., 1978. S. 155.

83 Russian archive. Great Patriotic War-T. 15 (4-4). M., 1997. S. 45.

84 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 33.

85 Calculated according to: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. M., 2007. S. 77.

86 Ibid. P. 83. |

87 Markovsky V., Medved A. Weapon "pawn". S. 27.

88Fedorov A.G. The sky was destiny. M., 1973. S. 129.

89 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 36, 123.

30 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 2. M., 1999.S. 22.

18 A. Smirnov 545

91Ibid. Part 1.S.26.

92 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 75.

93 Fedorov A.G. The sky became destiny. S. 131; Ratkin V. Hero of the Soviet Union N.I. Gapeyonok. P. 13. 94 Cited. Quoted from: Martianov V.

Ivan Ivanovich Kabakov // World of Aviation. 2002. No. 1. P. 17. 95 Cited. Quoted from: Medved A.N., Khazanov

D.B. Pe-2.Ch dive bomber. 1.C. 17-18.

96 Fedorov A.G. The sky was destiny. S. 130.

97 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch.2.S.22:P.1.S. 26.

98 (it. according to: Ibid. Part 1. S. 18.

99 Ibid. S. 34.

100 Quote by: Markovsky V., Medved A. Impassable "pawns" // Avia master. 1997. No. 4-5. S. 42.

191Gorbach V. Above the Fiery Arc. Soviet aviation in the Battle of Kursk. M., 2007. S. 27, 337; Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. pp. 75, 76. By October 1943, 126 crews (including 104 as part of a group) were able to bomb from a dive in the corps, while the vehicles in it by July 1943. was 179, in June 1944 - 185 (Medved A.N., Khazanov D.B.

Pe-2 dive bomber. Part 1. S. 32; Khazanov D. Battle over Iasi. The failure of the last offensive of the Luftwaffe in the East // Aviamaster. 1999. No. 4. S. 31).

102 Fedorov A.G. Pilots in defense of Moscow. M., 1979. S. 75.

103 Kotelnikov V.R., Petrov G.F., Sobolev D.A., Yakubovich N.V. "Americans" in Russia. M., 1999. S. 106.

104 Morozov M. Drown them all?! Air Force of the Black Sea Fleet in the operation to liberate the Crimea // History of Aviation. 2000. No. 6. S. 30.

195 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 35; Martianov V. Decree. op. S. 18.

106 Fedorov A.G. The sky was destiny. pp. 108-109, 218-219.

107 Morozov M. Bombs on Constanta // Aviamaster. 2002. No. 5. C.7. The author incorrectly conveys the sound of the names of the Romanian destroyers.

108 Ibid. pp. 11, 15, 16 (the author incorrectly conveys the sound of the names of the Romanian destroyers); Baevsky G.A. With aviation through the twentieth century. M., 2001. S. 145.

109 Khazanov D.B. 1941. War in the air. Bitter lessons. S. 340.

110 Aircraft building in the USSR. 1917-1945 Book. I. M., 1994. S. 142.

111 Ratkin V. Hero of the Soviet Union N.I. Gapeyonok. S. 13.

112 Calculated according to: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. pp. 36, 66, 123.

113 Op. Quoted from: Ratkin V. Fighting friends. S. 30.

114 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 2. S. 22.

115 Schwabedissen V. Decree. op. S. 208.

116 Russian archive. The Great Patriotic War. T. 15 (4-4). S. 45.

117 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 75.

118 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 2. S. 22.

119 Schwabedissen V. Decree. op. S. 202. 120 Ibid. S. 207.

121 Rastrenin O. Broken sky. May - June 1943. M. 2007. S. 60, 65, 70, 122, 125, 130, 171, 259, 279; Zefirov M.V., Degtev D.M. "Laptezchnik" against the "black death". An overview of the development and actions of the German and Soviet attack aircraft at the entrance to the Second World

moat war. M., 2008. S. 123.

122 Kotelnikov V., Morozov M. Illegitimate bomber // History of Aviation. 2001. No. 2.C.7;
Ratkin V. Pe-8. Trial by war // MirAviation. 1997. No. 1.C.7.

123 Winter War 1939-1940. Book 2. pp. 115-116.

124 Ratkin V. Fighting friends. S. 30; Kotelnikov V., Morozov M. Neza horse-born bomber // History of aviation. 2001. No. 2. P. 7. N.A. Gunbin, who fought as a navigator on the Il-4 and V-25 long-range aviation, even claims that if the pilot clearly kept the course and flight speed, then a "good navigator" even from a height of 5000 m from the very first approach fell into a circle with a radius of 20 m (Drabkin A. I fought on a bomber. M. 2010. P. 164).

125 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 2.C.22.

126 | Shvabedissen V. Decree. op. S. 310.

127 Mellenthin F. Armored fist of the Wehrmacht. Smolensk, 1999, p. 415.

128 Op. by: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 83.

129 Shvabedissen V. Decree. op. S. 312.

130 Dotsenko V.D. Myths and legends of the Russian fleet. SPb. M., 2000. S. 269; Zefirov M.V. Asy > Bomber Aviation. M., 2002. S. 394-398.

131 Dotsenko V.D. Decree. op. S. 264-265; VED, N., Khazanov D.B. Pe-2.Ch.2 dive bomber. S. 31.

132 Calculated according to: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. P. 83. During this operation, the "pawns" of the 2nd Guards and 4th Bomber Air Corps bombed from a dive in about 2/3 of the sorties; at the same time, in the 2nd Guards, this was almost always done. This means that in the 4th - only about 1/3 of the sorties.

133 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 34.

134 Ibid. Part 2.C.22.

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135 //vabedissen V. Decree. op. S. 310; Fedorov A.G. Fate was not more. S. 162.

136 Schwabedissen V. Decree. op. P. 312. The author dates these strikes in the spring of 1945, but Bromberg was taken by Soviet troops on January 2nd.

137 Year 1945: "I ordered the punishment of these generals." From the diary of Marshal of the Soviet Union A.I. Eremenko // Military History Journal. 1994. No. 8.S. 24.

138 Op. Quoted from: Lavrenov S.Ya., Popov I.M. The collapse of the Third Reich. M., 2000. S. 188-189.

139 Ibid. S. 188.

140 Russian archive. The Great Patriotic War. T. 15 (4-4). pp. 44-45; Shvabedissen V. Decree. op. S. 211.

141 Ivanov V.M. War through the eyes of a lieutenant. 1941-1945. SPb., 2001.S. 15.

142 Arkhipov V.S. Time of tank attacks. M., 1981.S. 84.

143 Rokossovsky K.K. Soldier's duty M., 1988. S. 76.

144 Rodin A. "Volga! Volga! I am Oka" // Banner. 1984. No. 2. S. 132.

145 Markovsky V., Medved A. Impassable "pawns". S. 34; Khazanov D. "Eighty-eighth" against the USSR // Ac. 1993. No. 1.S.7; Not 111. S. 11, 15, 17, 33.

146 Kotelnikov V.R., Leiko O.Yu. Pe-2 dive bomber. M., 1993.S. 21, 25; Aircraft building in the USSR. 1917-1945 Book. I. S. 143; Khazanov D: "Eighty-eighth" against the USSR. S. 7; Not 111.S. 56.

147 Markovsky V., Medved A. Impassable "pawns". S. 40.

148 Kotelnikov V.R., Leiko O.Yu. Decree. op. S. 9.

149 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 30, 64.

150 See: Ibid. S. 67; Fedorov A.G. The sky was destiny. P. 143: Kotelnikov V.R., Leiko O.Yu. Decree. Op.C.9.

151 See: Fedorov A.G. The sky was destiny. S. 143.

152 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. pp. 78, 83. 85.

153 Drabkin A. I fought on a bomber. M. 2010. S. 183.

154 Markovsky V., Medved A. Weapon "pawn". S. 24; Khazanov D. "In-

seventy-eighth" against the USSR, p. 6; Non-111.S. 11, 13.

155 Schwabedissen V. Decree. op. pp. 204, 210.

156 Ibid. pp. 204, 208.

157 Ibid. pp. 206-208; Russian archive. The Great Patriotic War. T. 15 (4-4). 45.

158 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 33; Markovsky V., Medved A. Weapons "pawns". S. 27.

159 Medved A.N., Khazanov D.B. "Focke-Wulf" REM 190. Luftwaffe multipurpose fighter. M., 2007. S. 57; Medved A.N. Focke

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Wolf RV190. M., 1993. S. 61; Zefirov M.V. Aces of the Luftwaffe. Day fighters. T. 2. M., 2002. S. 226.

160 Calculated according to: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 67.

161 Russian archive. The Great Patriotic War. T. 15 (4-4). pp. 379, 386; Perov V., Rastrenin O. Sturmovik IL-2. S. 83.

162 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 1. S. 32; Russian archive. The Great Patriotic War. T. 15 (4-4). S. 3179.

163 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 32; Perov V., Rastrenin O. Sturmovik IL-2. S. 101.

164 See, for example: Markov A. The bomber, whom the fighters were afraid of // Model designer. 1987. No. 8.S.9.

165 Pavlov A. The most dangerous enemy // Aviamaster. 2002. No. 7. P. 45-47; Sobolev D.A., Khazanov D.B. German trace in the history of domestic aviation. S. 179; Romanov V. Mezzegzspt VT.109. M., 1994. S. 29; Google Yu. Single-engine fighters 1930-1945. (Speed or maneuverability? Both speed and maneuverability!). Kiev, 1998. S. 23. The upper limit of the speed of the fighter BE109E-4 at an altitude of 5000 m was calculated by us on the basis of the assumption that the speed of the specimen, whose data (near the ground and at an altitude of 4000 m) are given by V. Romanov, at all altitudes exceeds the speed of the specimen, whose data was published by Yu.A.Gugley, is at the same 9E - 10 km / h as the ground and at an altitude of 4000 m.

166 | it. by: Sobolev D.A., Khazanov D.B. Decree. op. S. 174.

167 Medved A. "Super pawns" // Aviamaster. 1998. No. 2-3. S. 33; Khazanov D. Werner Melders. P. 31. In the last work, it is indicated that, planning at an angle of 2-5 °, the Pe-2 can also move away from the VN! 09Ÿ However, the fact that only slightly heavier and faster than the Friedrich B1109Ÿ-4 in this case was catching up with the experienced Pe-2I (Medved A. "Superpawns", p. 37), which was not inferior to it in speed, makes doubt the validity of D.B.Haz's statement

new.

168 Medved A. "Super pawns". P. 37. See also note 167 to this chapter.

169 Google Y. Decree. op. S. 23; Rusetsky A. Focke-Wulf Em190A, E, S. Mn., 1994. S. 24; Aircraft building in the USSR. 1917-1945 Book. IP. P. 85. For RM/190A-Z A.I.Rusetsky gives the data shown when the engine is running at nominal mode, and Yu.A.Guglya - the data shown in the afterburner; At the same time, it should be taken into account that the aircraft, whose characteristics are given by A.I. Rusetsky, was in operation. The EM/190A-4 speed (as we substantiated in the fifth section of the PY chapter of this work) was practically equal to the speed of RU190A-5, whose data were published by A.I. Rusetsky.

170 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 1.S.11.

171 Ibid. S. 24.

172 Ibid. S. 22, 25; Markovsky V., Medved A. Impassable "pawns". S. 38.

173 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 24.

174 Markovsky V., Medved A. Impassable "pawns". S. 38.

175 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 1.S.27.

176 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. pp. 56, 58, 60, 65; Markovsky V., Med after all A. Impassable "pawns". pp. 38, 40.

177 World War II bombers. 1939-1945. 3. M., 1994. S. 40; Middeldorf E. Russian campaign: tactics and weapons. St. Petersburg; M., 2000. S. 274-275.

178 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 19.

179 Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. pp. 62, 63, 65.

180 Romanov V. Decree. op. P. 29; Akapiev V.L. The collapse of the Luftwaffe in the Battle of Kursk // Military History Journal. 1999. No. 2. S. 15; Google Yu Decree. op. S. 23, 36; Aircraft building in the USSR. 1917-1945 Book. N.S. 110.

181 The 19th aircraft of the 205th series developed (in August 1943) 521 km / h (Med after all A.N., Khazanov D.B. Pe-2 dive bomber. Part 1. P. 31).

182 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 33.

183 Ibid.S. 37-38.

184 Markovsky V., Medved A. Impassable "pawns". S. 43.

185 Op. by: Sobolev D.A., Khazanov D.B. Decree. op. S. 174.

186 Bolotin D.N. Soviet small arms. pp. 298-299.

187 Op. Quoted from: Markovsky V., Medved A. Weapon "pawns". S. 27; see also: Medved A.N., Khazanov D.B. Dive bomber Pe-2.Ch. 1.C. 17.

188 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 17; Shvabedissen V. Decree. op. S. 119.

189 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Part 2.S. 29.

190 Cited. by: There. Part 1.S.22.

191 Ibid. S. 23.

192 Gorbach V. Decree. op. S. 99.

193 Ibid. pp. 120-121.

194 Schwabedissen V. Decree. op. pp. 119, 218; see also: Medved A.N. Focke-Wulf EM/190. S. 61.

195 Op. by: Medved A.N., Khazanov D.B. "Focke-Wulf" REM 190. S. 56. -

196 Rusetsky A. Decree. op. P. 18. |

197 Medved A.N., Khazanov D.B. Pe-2 dive bomber.

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A "pawn" that has become a queen. S. 67; They are. "Focke-Wulf" RM 190. P.57.

198 Medved A.N., Khazanov D.B. "Focke-Wulf" EM / 190. S. 57.

199 See: Shvabedissen V. Decree. op. pp. 119, 218.

200 Gorbach V. Decree. op. S. 99; Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 67.

201 [Sh1vabedissen V. Decree. op. pp. 306, 310.

202 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 32; Khazanov D. Battle over Iasi. The failure of the last offensive of the Luftwaffe in the East // Aviamaster. 1999. No. 4. S. 31.

203 Sh/vabedissen V. Decree. op. S. 319.

204 Ibid. S. 310.

205 Fedin V.T. Journalism 1987-2003. About the war, about myself, about books about the war, about tanks, airplanes and people. M., 2003. S. 52.

206 Ibid: Shvabedissen V. Decree. op. pp. 286, 303.

207 Anisimov V.T. The fate of the dive bomber. M. 2009. S. 167-168.

208 Calculated according to: Medved A.N., Khazanov D.B. Pe-2 dive bomber. A "pawn" that has become a queen. S. 84.

209 Ibid. S.73, 83, 84, 85.

210 V.R. Kotelnikov, G.F. Petrov, D.A. Sobolev, N.V. Yakubovich, Decree. op. S. 102.

211 See ; There. pp. 103-104; Bombers of the Second World War. 1939-1945. 4. M., 1994. S. 18.

212 Medved A.N., Khazanov D.B. Pe-2 dive bomber. Ch. 1.S. 37; Kotelnikov V.R., Petrov G.F., Sobolev D.A., Yakubovich N.V. Decree. op. S. 104.

213 Kotelnikov V.R., Petrov G.F., Sobolev D.A., Yakubovich N.V. Decree. op. S. 102.

214 Calculated according to: Gorbach V. Decree. op. pp. 477, 484-486.

215 Calculated according to: Alekseenko V. Soviet Air Forces on the Eve of the Year of the Great Patriotic War // Aviation and Cosmonautics Yesterday, Today, Tomorrow... 2000. No. 3.S. 8.

216 Gorbach V. Decree. op. S. 374.

217 Rudel H.W. Dive Pilot // Bombs Dropped! M., 2002. S. 130.

218 Morozov M. Drown them all?!.. P.27.

219 Rudelch.W. Decree. op. pp. 248, 253, 319.

220 Novikov A.A. Decree. op. S. 294.

221 Aircraft building in the USSR 1917-1945. Book. I. S. 146.

222 ||it. Quoted from: Kozhevnikov M.N. The command and headquarters of the Soviet Air Force

Army in the Great Patriotic War. 1941-1945. M., 1985. pp. 109-110.

223 Calculated from: Aircraft building in the USSR, 1917-1945. Book. I. S. 236, 148. However, the data of V.I. Alekseenko, according to which in 1942 63 Tu-2 were sent to the Red Army Air Force, and in 1943

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79 (V. Alekseenko, op. op. p. 7), indicate that several times more than 16 were built in the 43rd Tu-2.

224 ||vabedissen V. Decree. op. S. 320.

225 Yakovlev A.S. Purpose of life. (Notes of an aircraft designer). M., 1973. pp. 333-334.

226 He-111.S. 10-18, 24, 29.

227 Rodionov I. I., Sovenko A. Yu. Decree. op. S. 13; Kotelnikov V. "Not legitimate" bomber // History of Aviation. 2001. No. 5.S.27-28; Not-111.S.56.

228 Rodionov I.I., Sovenko A.Yu. Decree. op. S. 13.

229 Novikov A.A. Decree. op. S. 295.

230 Calculated according to: Gorbach V. Decree. op. S. 203 204, 214.

231 Calculated from: Ibid. pp. 204, 214, 318.

232 Calculated from: Ibid. S. 319.

233 Op. by: There.

234 During the first days of combat work during the daytime in the division, there was a case of a collision of aircraft in the air and a case when one group crashed into another, due to which the tight formation fell apart. The veteran of the 890th long-range air regiment D.P. Vaulin (Drabkin A. Decree. op. S. 93).

235 Rodionov I.I., Sovenko A.Yu. Decree. op. P. 14, inset (performance characteristics of Il-4 bomber variants).

236 Aircraft building in the USSR 1917-1945. Book. I. S. 154; Sobolev D.A., Khazanov D.B. Decree. op. S. 181.

237 Shakhurin A.I. Wings of Victory. M., 1985. S. 238.

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289 Calculated according to: Medved A., Khazanov D. Target - Helsinki. S. 28.

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Head\M

COMBAT WORK OF THE GERMAN BOMBER AVIATION

Unlike the Soviet one, the German bomber aviation was organizationally unified, not subdivided into front-line and long-range ones. The same air units, the same machines operated, depending on the task received, both against troops on the battlefield and against objects located deep behind enemy lines. The main aircraft of the Luftwaffe bomber aircraft were the Junkers L188 and Heinkel He111 two-engine bombers; besides them, in 1941 on the Soviet-German front

machines of the same Dornier Do 17 class fought, and in 1944 - a small number of heavy four-engine Heinkel He 177. Since the autumn of 1944, twin-engine piston bombers were built by the Germans and used only in

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on an extremely limited scale: the lack of fuel and production capacity forced the sacrifice of bomber aircraft in favor of fighter aviation, which was urgently needed to repel raids on the Reich.

1. WHAT WAS THE EFFICIENCY OF THE GERMAN TWIN-ENGINE BOMBERS?

For the reasons we described in Part II, it is possible to assess the degree of effectiveness of the combat work of bomber aircraft only on the basis of data from the side that was attacked by this aircraft, i.e., in our case, only on the basis of Soviet sources. Already those of them that have been published or introduced into scientific circulation by researchers allow us to come to a very definite conclusion: if "the results of the activities of the Soviet bomber aviation turned out to be limited", then the same cannot be said about the Luftwaffe bomber aviation operating on the Soviet-German front.

Here, for example, are the fruits of her work in the summer of 1941. Already on June 22, German bombers operating in the Leningrad strategic direction (i.e. Li 88 from the 1st, 76th and 77th bomber squadrons) managed to disrupt the centralized command of the Soviet troops North-Western Front. "Communication with the armies," Chief of Staff of the Front P.S. Klenov reported to the General Staff on the evening of June 23, "almost did not work due to special bombardments of communication centers and lines!" Twin-engine "Junkers" significantly weakened, further, the force of the counterattack of the 21st Mechanized Corps of the North-Western Front near Dvinsk on June 28, 1941. Even in the extremely lacquered, "ceremonial" memoirs of D.D. Lelyushenko, who then commanded this formation, it is recognized that On June 25-27, when the corps was moving out of the Idritsa region, continuous bombardments inflicted "considerable losses" on it. The memoirist does not mention at all the non-combat losses of tanks that were typical for the first days of the war, caused by breakdowns on the march, so most of the 79 T-26s and BT-7s lost by the 21st mechanized corps during the advance to

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Dvinskuz, can be safely attributed to 188 (note that in the 12th mechanized corps of the same front they destroyed 44 BT-7 and T-26 in 22-23 June alone). In addition, La 88 delayed

whether a counterattack on Dvinsk lasted a whole day: "all regroupings, movements and offensive actions had to be carried out at night, since during the day the enemy's bomber and fighter aircraft inflicted huge losses and frustrated any plans" ... 5

No less significant was the role of La88 of the 1st, 76th and 77th squadrons in disrupting the counterattack of the 3rd Panzer Division of the 1st Mechanized Corps of the North-Western Front near Ostrov on July 5, 1941. According to Soviet data, from fire German tanks and artillery and anti-aircraft bombs, the division lost that day 83% of its tanks - 215 vehicles, of which the "Junkers" should have, if not 140 (as the Germans claimed), then, in any case, several dozen KOV .

In August 1941, La88 strikes by the same formations, as well as Ro17 from the 2nd bomber squadron "Holzhammer" and the III group of the 3rd bomber squadron "Blitz" on the areas of concentration of troops, concentrations of tanks, artillery positions "affected the outcome many battles" and allowed the Germans to break the defense of the troops of the Northern Front on the Luga line.

The results achieved by the German bombers operating in the summer of 1941 in the Kiev strategic direction (i.e. L188 from the 51st and 54th and He! 11 from the 55th bomber squadron) must also be recognized as significant. Their strikes seriously complicated the actions of the troops of the Southwestern Front in the June battle in the Lutsk-Dubno-Brody region. Thus, the "significant losses" that the 9th mechanized corps suffered on June 26 and 27, 1941 near Lutsk and which forced it to stop the offensive, were caused, according to the report of commander-9 K.K. Rokossovsky, primarily by massive bomb run. N.V. Feklenko, the commander of the 19th mechanized corps that fought near Dubno, reported to the front headquarters in those days about the "great damage" from German bombers? And the bombing strike inflicted on June 26 by 18,188 from the [group of the 51st Edelweiss bomber squadron (according to another

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version - 18 Not! 11 from the 55th Greif bomber squadron) at the location of the 15th mechanized corps west of Brod, actually decapitated the corps, putting its command post out of action. Due to the loss of command and control, it was not possible, in particular, to bring into battle that day the reassigned 15th 8th Panzer Division of the 4th Mech Corps ... vision of the 6th Army, and on the night of July 3, it was the attacks of the "Junkers owls" from the "Edelweiss" that allowed the enemy to dismember and encircle the 80th Infantry Division of the 6th Army east of Ternopil. According to the reports of the People's Commissariat of Railways, during the first 50 days of the war, L188 and He!11 201 times destroyed the tracks on the South-Western Railway, stopping the movement

zhenie for several hours, and even days; in August 1941 they did it 39 times!0.

As can be seen already from these episodes, the results of the work of L188 and He! 11 could have not only tactical, but also operational significance. Thus, the "Junkers" of the 1st, 76th and 77th bomber squadrons, in fact, decapitated the troops of the Northwestern Front, and with attacks on the 21st mechanized corps and the 3rd tank division played an important role in frustrating the attempts of his command hold on to large natural boundaries - first on the Western Dvina, and then the bunk. Great ... The strike of 18,188 from the 3rd bomber squadron "Blitz" on the command post of the Western Front in Kasna (north of Vyazma) on October 2, 1941 also assumed operational significance: having destroyed the wire connection with the armies, these 18 aircraft "in to a large extent "disorganized command and control of the front troops in the first days of the battle for Moscow...!1

The Luftwaffe twin-engine bombers more than once succeeded in influencing the course and outcome of operations even in 1942. For example, during the Battle of Kharkov on May 15, 1942, L188 strikes from the 51st, 76th and 77th He! Eleven of the 55th bomber squadrons significantly reduced the rate of advance of the southern strike force of the Southwestern Front. They not only inflicted heavy losses on the infantry divisions advancing in the first echelon, but also delayed the advance to the front line of the 21st and 23rd Panzer Corps, which were supposed to capitalize on success, turning it from a tactical one.

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into the operational. In general, it was noted in the report of the High Command of the South-Western Direction to I.V. Stalin on the results of the Kharkov battle of 1942, "the enemy aircraft played a large role in the defeat of our troops in this operation, which from the second day of our offensive won air supremacy and continuous strikes a large number of aircraft on the troops inflicted on

defeat, chained to the ground and deprived them of maneuver on the battlefield!

In September 1942, this situation was repeated on the Volkhov front - where La88 (from the 6th, 51st and 77th bomber squadrons) and He! 11 (of the 27th and 53rd bombers) attacked the 2nd shock army, which wedged into the German front in the Sinyavino area (between Lake Ladoga and Mgoi) and threatened to release Leningrad. "In addition to losses in people," reported | October 1942 to I.V. Stalin on the results of the Sinyavin operation, the commander of the Volkhov Front, K.A. Meretskov, - the troops suffered significant losses in materiel from artillery fire, heavy mortars, and especially from massive raids by enemy bomber aircraft "! 3. "Our troops," he adds in his memoirs, "stubbornly tried to gain a foothold on the achieved lines, erecting defensive structures at night. But during the day, the enemy, by continuous bombardment, leveled them with

earth! 4. All this, of course, contributed to the fact that the 2nd shock was unable to repel the counterattacks of the Germans and not only did not break through the blockade of Leningrad, but also ended up surrounded by research institutes ...

At the end of July 1942, 488 and HeI] 1 - wiping entire railway junctions off the face of the earth and putting out of action about 18 thousand wagons - completely paralyzed rail traffic in the direction of Stalingrad - one of the two main goals of the German summer offensive. With strikes on August 24-31, they again completely paralyzed traffic along the Stalingrad-Lipetsk and Stalingrad-Saratov highways. "As a result, the troops had to be unloaded tens of kilometers from the front" and, as in the Crimean War, they had to be sent further in marching order. In September, unloading had to be carried out already for 250-300 km ... To this

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In mid-August, laying mines and hunting for river boats, "Heinkels" from the 27th and 55th bomber squadrons reduced the delivery of Baku oil along the Volga to such an extent that a significant part of the Volga fleet had to be transferred to wood fuel - which reduced the speed of delivery of military cargo to Stalingrad. Only from July 25 to August 10, 1942, every fourth ship sailing along the mined section of the Volga sank, and 115,000 tons of oil products perished! And on August 9, a strike by 12 Heinkels on the Sarepta railway station deprived the Stalingrad Front of most of its stocks of artillery shells...!

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German twin-engine bombers more than once became a factor of operational significance even in 1943. So, in the spring of this year, La88 and Not! 11 of the 4th Air Fleet played an almost decisive role in disrupting the attempts of the North Caucasian Front to break through the famous "Blue Line" on the Taman Peninsula and complete the liberation of the North Caucasus. Having launched an offensive on April 4, 1943, in the area of the villages of Krymskaya and Varenikovskaya, the Soviet troops immediately found themselves "literally pressed to the ground" by massive bomb attacks and were forced to go on the defensive already on the 6th, without having achieved any progress. On April 14-17, everything happened again: continuous bombardments made it possible to advance only a few kilometers - or only in the area of Krymskaya, which was still only on the outskirts of the Blue Line proper. The third offensive, which began on April 29, lasted until May 19, but - not least because of air strikes - only led to the capture of Krymskaya. The front was able to start breaking through the Blue Line proper only on May 26, 1943, by striking in the Kievskoye and Moldavanskoye areas. And again massive blows L188 and Not! 11 stopped the advancing, fettered the maneuver with reserves!6. Until June 7, when the offensive finally fizzled out, it was possible only in some places to penetrate into the enemy's first line of defense ...

To a large extent, due to the opposition of L188 and He111, all of the same 4th air fleet (besides them, L187 also worked there) bogged down and started on July 17, 1943 with

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the goal of the liberation of Donbass Izyum-Barvenkovskaya operation. Systematically destroying the crossings across the Seversky Donets in the Izyum region, the German bombers and dive bombers did not allow time to transfer to the bridgehead captured on the right bank part of the forces of the 8th Guards Army (two divisions of the 28th Guards Rifle Corps and the tank group of M.G. Vainrub) and the second echelon of the Southwestern Front - the 1st Guards Mechanized and 23 Tank Corps. The last, in addition, the bombing caused "considerable damage." In conditions when the enemy had already concentrated his reserves against the attacked sector, such a delay in building up the force of the strike naturally contributed to the failure of the offensive - especially since the 8th Guards Army "because of the crossings disrupted by enemy aircraft" began to feel a shortage of ammunition ... 17

In the struggle against the USSR, the bomber aviation of the Luftwaffe more than once achieved the effect of a strategic scale. So, on November 4-6, 1941, having completed only 28 self-summersorties to bomb Gorky, He111 from the 100th bombing group, the III group (1st formation) of the 26th bomber squadron "Leuven" and [group 28 The 1st bomber squadron completely destroyed the radio telephone plant named after Lenin (No. 197) and the Dvigatel Revolutsii plant (aka Mortar Plant No. 718) and caused great damage to the Gorky Automobile Plant. As a result, the production of 120-mm mortars and 82-mm 132-mm rockets ceased in Gorky, the production of field radio stations and telephones practically ceased, and the production of 82-mm mortars and artillery shells at GAZ, 76-mm divisional guns was "significantly slowed down". ZIS-3 at Artillery Plant No. 92 and T-34 tanks at Plant No. 112 (Krasnoye Sormovo; the last two enterprises depended on supplies from Dvigatel Revolutsii and GAZ) 18. And this is in the most intense period of the battle for Moscow!

In June-July 1942, L188 from the 30th bomber squadron "Adler" (together, however, with L187) destroyed the "main part" of the Murmansk port, and the latter "turned out to be unable to receive large transports and

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work on the goods they deliver." This circumstance directly influenced the decision of the British government to suspend the dispatch of Arctic convoys to the USSR; so about-

at once, did German bomb carriers temporarily disrupt the supply of military materials to the USSR from abroad? .

Continuously bombing in September-October 1942 the Urbakh railway (east of Saratov. - 4.S.) - Astrakhan, L188 and He111 significantly slowed down the flow of Baku oil to refineries in the Volga region. In addition, on September 8-9, "Heinkels" from the [group of the 100th bomber squadron "Viking" and the III group of the 4th bomber squadron of the General Vefer bombardment squadron burned oil storage facilities in Kamyshin and Astrakhan (only in the latter about 400 000 tons of oil products), on the night of September 24, He111 from the 55th and L188 from the 76th bomber squadron destroyed a cracking plant in Saratov (which stopped working before the end of the year), and on October 26-31, "Heinkels" from [group The 100th and Junkers from the 76th squadron sank 15 oil tankers in the Astrakhan roadstead alone (destroying about 15,000 tons of oil products). As a result, German bombers caused a noticeable shortage of oil products in the USSR (in September, 30-40% of the required amount of oil was supplied to oil refineries, and in October, November and the first half of December - an average of only 25%, "moreover, the curve [...] went down") and reduced the supply of fuel to the active Red Army-0.

The mining of the Volga fairway on the 800-kilometer section between Astrakhan and Saratov, carried out in May 1943 by He111 from the same [Viking group], forced ships to be sent in convoys behind trawls and again led to a decrease in delivery oil products (if during the last ten days of April they managed to transport 445,000 tons of them along the Astrakhan-Saratov section, then for the whole of May - 765,000 tons).

The results of the strategic operation carried out by the Luftwaffe on June 4-27, 1943, also affected the entire Red Army. -yi 100th and L188 from the 1st, 3rd and 51st bomber es

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about 30 industrial enterprises were put out of action, including the almost complete destruction of the Gorky Automobile and Yaroslavl Tire Plants, the cracking plant (secondary) and aircraft plant No. (center for the re-mothballing and repair of tanks supplied from the USA and England) in Gorky. Since some of the destroyed factories supplied parts and assemblies for many others (for example, GAZ was the only manufacturer of wheels that equipped the majority of Soviet artillery guns, and the Yaroslavl tire factory supplied tires to all Soviet aircraft), in the USSR "the rate of production of all types of weapons - from shells and machine guns to tanks and aircraft. In particular, the Red Army is under-

received about 800 Yak-1 fighters and "approximately 2000 tanks, in addition, the growth of their production was significantly slowed down in the second half of 1943" and the start of production of T-8022 light tanks was disrupted. Finally, due to the loss of 61,000 (according to other sources, 31,000) tons of oil products in Saratov and the cessation of oil refining, the army in the field did not receive 22,000 tons of gasoline on the eve of the Battle of Kursk. This is only a little less than what was available by July 5 [1943] on as many as five fronts — the Western, Bryansk, Central, Voronezh and Stepnoy (28 49] tons, including the domestic one - 13 975 tons) - and approximately as much as did these fronts spend one week of the Battle of Kursk! The fronts had to cut fuel consumption limits, and then affect emergency supplies ...

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Night attacks by German bombers on Leningrad in March 1943 led to serious destruction at the 1st, 2nd and 5th hydroelectric power stations and such important defense plants as Bolshevik and No. 174 named after Voroshilov.

2. WHY BEATS 4088 AND NOT! 11 WERE HIGHLY PERFORMING?

The high efficiency of the German bombardment

ground-attack aviation was determined, first of all, by the high effectiveness of its bombing strikes. If back in 1942—

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1943 the losses of the Germans from the strikes of Soviet bombers, "with the exception of the battle of Stalingrad, were quite low" and "the German troops did not experience any special problems with them," the Soviet side could not say this. So, at the beginning of the border battle on the Southwestern Front, L188 and He1 1] became "the most terrible enemy of our artillery, even before the start of the artillery duel they knocked out our batteries. They were an even more terrible adversary for columns of motor vehicles on the roads of the Lvov ledge. [...] Crowds of people and cars in traffic jams and narrow spaces were mowed down by aerial bombs with frightening efficiency." On June 26, 1941, inflicting a blow on the 12th Panzer Division of the 8th Mechanized Corps, He1 11 from the 55th Bomber Squadron put out of action all the tractors of its howitzer artillery regiment, destroyed most of the gun crews and burned a large number of trucks with ammunition and fuel trucks. (A.V. Isaev, who brought these facts, points out that the actions of the Soviet bombers also had a "significant impact" on the enemy's tank divisions at that time and also "made an invaluable contribution to reducing their combat capabilities" - however, no figures and other does not provide specific information about the damage suffered by the Germans; in the German descriptions cited by the researcher,

In the reports of these battles, such damage is mentioned only once - when it is mentioned "many wounded and killed soldiers" of the 15th tank regiment of the 11th tank division ... 24.) According to the memoirs of Ya.K. at the Romodan station (northwest of Poltava) in early July 1941, his 67th railway battalion lost about half of its personnel? The striking capabilities of the Luftwaffe bomber aviation are clearly seen in the example of a raid on August 29, 1943, by about 100 vehicles on the 6th Guards Cavalry Corps of the 33rd Army of the Western Front east of Yelnya. "For a moment," testifies the former head of the operational department of the army headquarters, I.A. Or on the example of strikes on the Urbach-Astrakhan railway in September-October 1942: "every day

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Passenger and freight cars, platforms with machinery, and oil tanks were on fire in various areas. Gas stations for steam locomotives, warehouses with coal, arrows and sidings were laid out at most of the stations. Communication lines were destroyed almost along their entire length. [...] Particularly large destruction was observed on the 120-kilometer Elton-Baskunchak section. [...] All 120 km to Baskunchak, - the driver S. Vereveykin recalled about the flight made at the end of October, - I only saw burnt trains, spilled oil, mountains of mangled rails, stations wiped off the face of the earth? "All railway structures were destroyed, stations, sidings and even railway booths were destroyed," Colonel-General A.I. the Soviet Supreme High Command had to draw the attention of the front commanders to the fact that "troop formations, their headquarters, warehouses, defensive lines, crossings, airfields, etc. — A.S.] objects" by the enemy "are subjected to effective bombing"?9.

In turn, the high effectiveness of bombing strikes by German twin-engine bombers was determined by the high accuracy of bombing and the high power of the bomb salvo.

The L188s were particularly distinguished by the accuracy of bombing, which - being capable of diving at an angle of up to 80 ° - could ensure the destruction of even small-sized point targets. Here, these heavy twin-engine vehicles were almost as good as the single-engine La8730 dive bombers. Having dived on the morning of June 29, 1941 on the Eastern Fort of the Brest Fortress, five L188 from the 3rd bomber squadron placed 6 out of 10 500-kg bombs dropped by them exactly on the outer rampart of the fort (in the casemates of which the defenders were), and the evening strike with the help of six vehicles, he already gave more than 80% of direct hits (10 "five hundred" out of 12)31.

On the night of June 5, 1943, the L188 group, which struck from a dive at water intake stations on the Oka and the main nodes of the water supply network in the area of the Gorky Automobile Plant, achieved six direct hits on

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the main water conduit and hit the water supply and heating control unit and the Avtozavodskaya CHPP (so that GAZ, whose shops were then bombed by other groups, turned out to be completely de-energized and deprived of water - and hence the ability to fight fires ...). The next night, the "junkers" again placed several bombs exactly in a water conduit with a diameter of 0.6 m and disabled both the main and reserve power lines, and on the night of June 14, before the bombing of the Gorky plant "Revolution Engine", the same they also destroyed its water intake station with a pinpoint blow ... Of course, L188s were not always so accurate. So, having dropped 36 and 117 bombs, respectively, on the Gogolev and Borispol airfields near Kiev on June 25, 1941, the aircraft of the 54th Totenkopf bomber squadron in -3, and in Boryspil - to burn only one out of about a dozen TB-7s ("although it seemed hard not to hit these giants") and to destroy two warehouses³². The strikes of the 1st group of the same squadron on bridges across the Dnieper in the Kiev region in July 1941 turned out to be frankly unsuccessful. And on January 23, 1942, on the Kalinin Front, 24 L188 bombed a column of 22 Soviet tanks for about two hours, but did not achieve a single direct hits³³. However, it must be taken into account that in the latter case, the Germans dropped their bombs not from a steep, but from a gentle dive; in addition, the Soviet source does not say how many tanks were put out of action by close explosions of 250-kg bombs (we note that on June 22, 1941, the 28th tank division of the 12th mechanized corps of the North-Western front, only from one L188 raid, 10 BT-7)³⁴ failed. And the Totenkopf squadron, which failed to destroy the Dnieper bridges, in the same July days of 1941, inflicted "heavy damage" on the troops defending the Kiev fortified area with aimed bombing from low altitudes ... ³⁵

It is also indicative to compare the results of the L188 strikes and the Soviet Pe-2 dive bombers on destroyer-class ships (recall that in the Soviet fleet of those years this class was called "destroyers" and included two subclasses - "destroyer squadrons" and "destroyer squadrons").

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destroyer-leaders"). In cases where this target was stationary, Soviet dive bombers managed to hit it only once or twice - and even then, perhaps by accident. Damage the anti-aircraft artillery of the German

destroyer 734 in the Danzig Bay on April 16, 1945 could not have been the 16 Pe-2s that then fell on it, but the escort fighters that attacked with them³⁶. As for the damage by the "pawns" of the 13th Air Division of dive bombers of the Air Force of the Black Sea Fleet of the Romanian destroyer "Regele Ferdinand" in Constanta on August 20, 1944, it is not known whether this ship was bombed with precision. The strike of 12 Pe-2s from the 40th Air Regiment of dive-bombers against ships in Lesnaya Harbor (where the Regele Ferdinand was stationed) was improvisation and could have been delivered against "the harbor in general." The 18 "pawns" of the 29th Regiment, which attacked after them the moorings of ships in Lesnaya Harbor, bombed largely at random - through a smoke screen⁷⁷; in general, a direct hit on the Regele Ferdinand could have been accidental... The Germans, on the other hand, bombed the Soviet destroyers only with precision. And in order to achieve direct hits on the Baltic "Angry" (July 19, 1941 on the Heltermaa roadstead near Dago Island), only 4 L188 from the 806th bomber group were enough. At the same time, the ratio of the number of attacking aircraft and the bombs that hit the destroyer was 4:1, while when the Pe-2 hit #34 (if direct hits on the latter took place at all) - apparently, 16: 138. Four bombs, which hit the leader "Tashkent" on July 2, 1942 in Novorossiysk, and two that landed on July 16, 1942 in Poti in the Black Sea destroyer Bodry, were also the result of an attack by no more than 6-8 L188 from [group 76- th bomber squadron: in Novorossiysk 32 L188 and 32 He! 1] struck at least 18 ships and vessels, and even on coastal facilities; in Poti, 16 Junkers also had several targets³⁹. Consequently, in these cases, the ratio of interest to us should not have exceeded 4:1...

Attacking four more Soviet destroyers that stood motionless (the Baltic Engels on August 7, 1941 on the Rogokul roadstead and the Black Sea Bodry on November 2, 1941 in Sevastopol, Capable on April 10, 1942 in Novorossiysk

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and "Vigilant" in the same place on July 2, 1942), L88 (in the first case only 3, in the second - 4, in the third - 8) put 250-kg bombs either close to the side, or no further than >— 10 m from it - so that the ships received significant damage from shrapnel ("Vigilant" He 111 was sunk immediately after that). The ratio of the number of aircraft that attacked and the number of bombs that struck was 1:1, respectively; 1:1; 8:1.

When attacking destroyers on the move, Pe-2s achieved confirmed success only in one case: on April 8, 1945, 27 "pawns" of the 12th Guards Aviation Regiment of dive bombers of the 8th mine-torpedo air division of the Air Force of the Baltic Fleet with direct hits Niarni damaged the German 7.3141 in the Danzig Bay. In addition, on August 10, 1941. 2 Pe-2s and 5 SBs from the 72nd mixed aviation regiment of the Air Force of the Northern Fleet attacked in Baren-

the end sea 74, 7.10 and 7.16 - however, it is not known whose bomb damaged the close gap 74 ... 12,188 direct hits on a moving destroyer were also achieved very rarely - only in the Baltic "Karl Marx" in the Hara Laht Bay on August 8, 1941 Yes, in the Black Sea "Imperfect" near Cape Ayu-Dag on June 26, 1942. However, if the ratio of the number of attacking aircraft and bombs that hit the destroyer was 13.5: 1 when the "pawns" hit 1.31, then when the "Junkers" hit "for "Impeccable" - at most 7:1, and for "Karl Marx" - 1.5:1 (the latter, however, only walked away from the pier and did not have time to develop a course)⁴³. In addition, in no less than twelve cases, Soviet destroyers and leaders were damaged by bomb explosions placed by twin-engine "Junkers" in the immediate vicinity of the side. At the same time, the Baltic "Grozychiy" (July 16, 1941 in the Gulf of Riga) and the North Sea "Thundering" and "Crushing" (July 10, 1942 in the Barents Sea) each suffered from only two L188, and the Black Sea "Bodry" (October 31, 1941 between Evpatoria and Sevastopol) received about 2000 fragmentation holes! ⁴⁴

In total, during the war years, L188 sank 4 Soviet destroyers and leaders (Tashkent, Karl Marx, Angry and Imperfect) and inflicted significant damage on nine - Engels, Sharp-witted (June 25, 1941 virben

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Strashny (July 15, 1941 in the Gulf of Riga), Capable, Vigilant, Bodrom (three times; in addition to the two cases mentioned above, also on November 2, 1941 in Sevastopol), "Reasonable" (April 3, 1943 in the village of Rosta near Murmansk), "Tashkent" (June 27, 1942, at the Sevastopol - Novorossiysk crossing) and the leader of "Kharkov" (twice: May 18, 1942 at the Novorossiysk - Sevastopol and June 18 of the same year near Sevastopol)⁴⁵. On the account of the Pe-2 - only two to three seriously damaged destroyers ...

Of course, we must not forget that many L188 attacks on Soviet destroyers ended in vain, and Pe-2s carried out significantly fewer attacks on ships of this class than the Junkers. But if we compare only successful strikes, then here the superiority of the L188 in the accuracy of bombing is obvious.

Analyzing the reasons for this superiority, M.E. Morozov rightly points to the excellent 18846 bombsights; note that in 1942 they received a prefix that automatically took into account the speed and altitude of the flight and introduced a correction for the wind! Pe-2s, of course, were worse equipped here. However, according to the former Luftwaffe Lieutenant Colonel W. Greffrat, "German sights for dive bombing were by no means so perfect that one could count on accurate shots. falling into small targets when using air crews with an average level of training" ⁴⁷. And correct-

It was no easier to correct the aiming error by turning the plane along the course on the Li88 entering the peak than on the Pe-2. Not distinguished by the same aerodynamic perfection, the German bomber was, however, one and a half times too much heavier than the "pawn" and, of course, had to accelerate in a dive to the same high speeds as that one - and therefore "sit" in the air stream is no less dense than the Pe-2. In any case, the diving L188 obeyed the rudder just as badly as the Pe-248. And if the "Junkers" more often than the "pawns" hit the target, then this must be attributed primarily to the level of training of the pilots, for many of whom it was above average even by German standards. Indeed, if the Pe-2 pilots are afraid

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being late with the exit from the dive and crashing into the ground or into the water, they dropped bombs from a height of 1000-1500, at and 2100-2800 m, then the La88 pilots, even in a steep peak, would drop to 800, at and 450 m - and only then bombing was carried out, which, of course, turned out to be more accurate (due to the smaller spread of bombs). 50 L188s, which bombed on July 15, 1943, the artillery positions of the troops of the 69th Army of the Voronezh Front in the area of Yamka and Pravorot (on the southern face of the Kursk Bulge), dived from 1500 m to the 200-meter mark! 49 But withdraw a multi-ton (we repeat, more than one and a half times heavier than the Pe-2) L188 from the peak was at least no easier than a "pawn" ... Note that even in the most difficult periods - when there was an acute shortage of aircraft at the front - the Germans found the ability to ensure the proper level of training for L188 crews. For example, among the replacements that arrived in October 1941 in the Pgroup of the 30th bomber squadron, this level was, according to the veterans of the unit, "alarmingly bad"²⁰: flight schools lowered the requirements for trainees. However, the group continued to be kept in the rear for another month and a half after that, and the undertrained aviators managed to complete a solid training course. As a result, their very first front-line bombing, carried out on December 22, 1941 against the troops of the Soviet Western Front advancing south of Kaluga, was regarded by the command of the German division operating in this area as successful: as a result of the attacks of the group, "the enemy not only had no advance, but he even managed to push"²¹. The information, which occurs now and then in Soviet literature, that the Germans very soon found themselves forced to replenish their bomber aviation on the Eastern Front with undertrained crews, once again confirms the extreme unreliability of their source - the testimony of prisoners of war. They are refuted by the observations of the Soviet side itself. So, the pilot of La88, shot down in the second half of December 1941 on the Volkhov front, over the Bolshoy Dvor railway station (east of Tikhvin), testified during interrogation that in their detachment "there were only two masters of" blind "aircraft piloting. Leningrad pilots shot down one in November, shot down the second

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he himself became tym, and there is no replacement for them. Now there is only one youth in the detachment, recently graduated from flight schools. Young pilots have completed a course of accelerated training and do not know how to fly in difficult weather conditions, they do not master the art of timed bombing, even when bombing such large targets as a city or a railway junction, they take planes out of the clouds. The navigator of the crew showed the same thing. However, just a few weeks later, in January 1942, the very first L188, seen by the chief navigator of the Red Army Air Force B.A. True, he did not bomb because of the clouds, but nevertheless he brought the car to the target according to the calculation of the time and brought it extremely accurately - so that, suddenly emerging from the clouds, it was directly above the target. And this can hardly be considered an accident: after all, even in the Moscow strategic direction, where the Luftwaffe then suffered significantly greater losses, the Soviet staff officers constantly recorded a completely different picture than the one that was drawn by the captured aviators. So, in the second half of November 1941, the Soviet military historian points out, those who supported the Wehrmacht's offensive against Moscow "crews of fascist aircraft", "as a rule", "delivered bombing strikes from behind the clouds according to the timing [...]" 53. And in March 1942, the same author states, the "quality of bombing" of the German bombers operating in the Moscow direction even "slightly increased in comparison with the autumn period of 1941"!54

Also in the cell of 1943, the crews of the Luftwaffe bomber aviation were largely staffed with veterans with extensive combat experience, and young recruits entered combat units only after two years of training (the program of which included, in particular, flights at night)> >. Nizhny Novgorod resident V. Guryev, a witness to the raid on the Gorky Automobile Plant on the night of June 6, 1943, recalled how German bomb carriers harmoniously "walked in groups of 20 aircraft, four in a row" over the Oka River, as opposite the automobile plant they "turned sharply 90 degrees and calmly, as if on exercises, they bombed the workshops.

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Moreover, the impression was that each plane was going to a specific building of the plant "(so it was, in general, it was. - A.S.)56. Judging by the schemes of the fall of aerial bombs on the territory of GAZ, on the night of June 5, 1943, crews 188 and He! 11 achieved about 47% of direct hits on factory buildings (having hit them with 81 high-explosive bombs out of 172, whose fall was recorded), on the night of the 6th - about 35% (58 bombs out of 165), on the night of the 7th - about 55% (70 bombs out of 127; according to the Gorky Air Defense Service -

about 90 high-explosive bombs out of 170, i.e. about 53% dropped)⁵⁷. Thus, the average percentage of direct hits in three raids on GAZ (despite the fact that it was bombed not so much from a dive as from a horizontal flight) was approximately 45.

The good training of pilots and navigators also determined the high accuracy of the He111 strikes - which were bombed only from level flight. On October 6, 1941, the strike of three Heinkels from the 55th bomber squadron led to direct hits on the machine assembly shop No. Aircraft Plant No. 18. Of the four He111 from the 100th bomber group and the III group (1st formation) of the 26th bomber squadron, who dropped on the afternoon of November 4, 1941 (albeit from low altitudes) one 1000-kg mine or two 500-kg bombs on industrial enterprises of Gorky, three achieved 100% direct hits - hitting, as ordered, the thermal power plant of the Gorky Automobile Plant and the power station of the Dvigatel Revolyutsii plant (as well as the main building of Plant No. 197 named after Lenin). The fourth one landed in the repair and mechanical shop of GAZ with three 250-kg high-explosive bombs out of four...⁵⁸⁻³ in Saratov, 18 bombs, with direct hits destroyed four shops, on the night of June 8, 1943, no more than 10 vehicles from the P group of the same squadron (or from [group 100] achieved about 10 direct hits in corps of the aircraft engine plant No. 466 in Gorky, on the night of June 10, 1943, the 5th detachment P of the 27th bombardier group

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the leveling squadron "Bölke" (about ten He111) destroyed two workshops of the Yaroslavl tire plant ???. And on the night of June 24, during the attack on the Saratov aircraft plant No. 292, a single "Heinkel" (from the 55th or 100th squadron), although from a strafing flight, managed - as he was ordered - to hit with a series of high-explosive bombs into such a "thread" as a water main...

Cases are also known when He111 hit targets so little vulnerable to bombing from level flight as ships and bridges. November 12, 1941 only three "heinkel" from the 27th bomber squadron from a height of about 3000 m (!) managed to hit the Chervona Ukraine cruiser stationed in the South Bay of Sevastopol with one bomb (causing heavy damage to it), and another one was placed only 5-7 m from the side of the ship. A | June 1943 No! 11 of the 53rd bomber squadron "Legion Condor" managed to destroy the strategically important bridge across the Volkhov (threatening the supply of the troops of the Leningrad Front). The exact same cover at the beginning of October 1941 of the Mtsensk airfield (as a result of which some air regiments of the Air Force of the Bryansk Front practically lost their materiel)

six "Heinkels" from the 100th bomber group, according to the testimony of G.V.

As for night strikes, W. Greffrath noted that "a truly perfect night bomber sight did not receive mass distribution in German aviation until the very end of the war"⁶². Nevertheless, a quarter (15-20 out of approximately 70) high-explosive bombs dropped on November 4-6, 1941 in the dark on Gorky's defense plants He111 from the 100th bomber group, III group (1st formation) of the 26th bomber squadron and [groups of the 28th bomber squadron, gave direct hits to the factory buildings (in 3 or 4 out of 24 sorties, such hits were achieved 50-100%)⁶³. And another crew managed (as he was ordered to) to put 9 fragmentation bombs exactly on the power transmission line going to Gorky from the Balakhna State District Power Plant ... Attacking on the night of June 18, 1944, the Balti station in Mol

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Davia, "Heinkels" of the 27th bomber squadron, 90% of the bombs were dropped exactly on its territory * 4. For comparison, we point out that on the night of February 7, 1944, 728 (!) Il-4, Li-2, V-25 and Pe-8, whose targets were also only military targets, dropped 6443 bombs on Helsinki with a total weight of 910 tons (according to other sources, 7319 bombs with a total weight of 924.9 tons) - however, out of 17 defense plants, 11 large warehouses and several railway stations in the Finnish capital, only two warehouses and a railway depot were damaged ... ⁶⁵

Unlike Soviet bombers, L188 and He! 11 were not fond of non-aimed dropping of bombs "on the leader", but, on the contrary, sought to increase the accuracy of aimed bombing, making several (up to 8-10) visits to the target and dropping one or two bombs each time.

High-precision bombing He!111 contributes

whether the good aerobatic qualities of this aircraft were also good: unlike the same DB-3F and especially the Pe-2, the Heinkel was very stable in flight and easy to pilot. L188 also had good stability with respect to all axes - they also often bombed from level flight. In terms of ease of piloting, the twin-engine Junkers. inferior to the SB and DB-3, but "a very high qualification of the pilot", according to Soviet testers, still did not require⁶⁶ - again, unlike the Pe-2 ...

As for the power of the bomb salvo, here, firstly, it should be emphasized that the bomb load of 188 and He1 11 is very solid. Thus, the aircraft of the most common modification of the twin-engine

"Junkers" - L188A-5 - could lift up to 2500 kg of bombs, and finally displacing them at the beginning of 1942 L188A-4 with more powerful Lito211E engines - up to 3000 kg those. three times more than the main Soviet front-line bomber of 1942-1945. Pe-267. In practice, both Soviet and German aircraft rarely used the maximum capacity of their bomb racks, but the Junkers' triple superiority still remained. For example, during the beat

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you are for Moscow, the real bomb load of the Pe-2 did not exceed 600-700 kg (and in 1944, as we have seen, "pawns" rarely took on board more than 750 kg)⁶⁸. Meanwhile, L188A-5 and A-4 in 1941 usually carried 1900-2400 kg each (28 50-kg high explosives in the bomb bay and 2-4 250-kg under the wing, on an external sling). And during strikes on Stalingrad in September - November 1942, L188A-4 with Lito2113 engines] - since the distance to the target was small - they took on board 3000-3400 kg of bombs! "In terms of the power of a bomb salvo, each aircraft was really equivalent to an Il-4 flight or five Pe-2s"⁶⁹

The maximum bomb load of the Heinkels was approximately the same as that of the twin-engine Junkers: for the machines of the most common modifications in 1941, He! 111H-4, H-5 and H-6, it was 2500 kg, -to me! 11N-1]¹ and N-16 could also be loaded with 3000 kg⁷⁰. In practice, the Heinkels took on board much less. For example, He 111 Lieutenant E. von Glazov from the Shtgruppa of the 53rd bomber squadron on November 23, 1941 flew on a combat mission with only 1300 kg of bombs - with 16 50-kg high-explosives in the bomb bay and with one 500-kilogram on the external sling. "The 1st detachment of the 1st group of the 100th bomber squadron, having completed 1339 sorties from January 22 to July 1, 1942, dropped about 2000 tons of bombs"? - therefore, the average bomb load of one aircraft during this period was about 1500 kg However, compared to the Pe-2, this was a lot.

Secondly, L188 and He1 11 favorably differed from Soviet twin-engine bombers in terms of the maximum caliber of the bombs used. The design of German vehicles allowed the suspension of both 1400-, and 1500-, and 1700-, and 1800-kg bombs (He111N-5 could carry a 2500-kilogram bomb) - while for Pe-2 the limit was 500-, and for DB- 3F (IL-4) - 1000-kilogram. If the IL-4 could carry only one FAB-1000, then the He111 - which did not exceed or only slightly exceeded the Ilyushin machine in terms of the maximum bomb load - were able to lift two 1000-kg bombs (or mines), but He! 11ÿ-11] — and three?³. In addition, the German aviation commanders

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we used the capabilities of aircraft. Pe-2s, as a rule, used only 100-kg bombs; 250-kilogram ones were hung very rarely, and 500-kilogram ones - in very few cases. "Junkers" and "Heinkels" 250-kg land mines were used in almost every sortie! However, the same difference in the skill level of Soviet and German pilots could have an effect here: after all, taking off with heavy bombs on an external sling was a very difficult task. Not for nothing that even in the Soviet-Finnish war DB-3, which were piloted by young pilots, were issued on combat missions with only 500 kg of bombs instead of 1000-1100 kg.

The effectiveness of strikes La 88 and He 111 also increased the massive use of these aircraft. On August 23, 1942, 12 bomber groups were involved in the strikes against Stalingrad (in addition to the four La87 groups), but on that day "Stalingrad, as a city and industrial center, was destroyed." Almost all 10 bombing groups of the 4th Air Fleet took part in the raid on October 10, 1942, on an oil refinery in Grozny, but "the target was completely destroyed"⁷. A strike on the Balti station on June 18, 1944 was carried out by about 90 Heinkels, i.e. the entire 27th bomber squadron, or up to a third of all the Luftwaffe twin-engine bombers then operating between Polissya and the Black Sea. On the other hand, "noticeable" damage was also caused to the railway transportation of the 2nd Ukrainian Front⁷⁶. To strike at the airfields of the Poltava air hub, on which 137 American "flying fortresses" B-17 landed on June 21, 1944, more than half of all He 111 that were then available on the Eastern Front were allocated - about 200 machines from the 4th, 27th, 53rd and 55th bomber squadrons. On the other hand, having attacked the Poltava airfield on the night of June 22, this group managed to destroy, according to American data, 47 of the 73 B-17s sitting there (as well as two C-47 transports and one R-51 fighter) and damage all the other "fortresses" .. "⁷

Note that the massing of Luftwaffe bomber strikes was facilitated by another advantage.

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the power of his aircraft in front of the Soviet front-line bombers - a significant flight range of the L188 and He111 (about twice as long as the Pe-2). In order to concentrate the efforts of their bombers in any direction, the Germans often did not need to resort to the redeployment of air units: the Junkers and Heinkels could strike at fairly distant sectors of the front, taking off from the same airfield! So, having made a decision at 15 o'clock on June 21, 1944 to attack the airfields of Poltava and Mirgorod, the commander of the 4th Luftwaffe Air Corps R. Meister was able to implement it already on the night of the 22nd - although all the He111 squadrons involved in this operation were based on airfields, remote from Poltava

at 850-900 and even 1000 km - near Bialystok (4th), Terespol and Demblin (55th), Krosno (27th) and Radom (53rd). True, the Heinkels from the 27th and 53rd squadrons used Bialystok and Minsk as jump airfields, but this was done not because of the excessive remoteness of Krosno or Radom, but because of Meister's desire to assemble the entire strike group in the air even before the line approached front (because of which the Belke and Condor Legion vehicles had to fly to Poltava from southern Poland not in a straight line, but through Belarus) ... In the same cases when it was necessary, the Germans boldly carried out an airfield maneuver and did not stop at exposing entire strategic directions for the sake of concentrating most of their bombers on the decisive sectors of the front at the moment. In July-October 1942, the overwhelming majority of the Luftwaffe bombing groups operated on the southern wing of the Soviet-German front - but on the other hand, they kept under constant influence both the Volga shipping and the railways, which delivered Baku oil and transported troops and cargoes to Stalingrad, struck at the quarters of Stalingrad, which was stormed by the Germans, and at the Volga crossings, and at columns of troops, and at airfields and positions of anti-aircraft artillery near Stalingrad, and at Soviet troops in Ossetia and Chechnya, and at the industrial centers of the Volga region, and oil refineries in the North Caucasus, and ships in the Caspian Sea, and even hayfields in

19 A. Smirnov
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Western Kazakhstan ... To support the German offensive on the Kursk Bulge on July 5-12, 1943, 100% of the twin-engine bombers that the enemy then had on the Soviet-German front were involved!

As in the case of fighters, L187s, and attack aircraft, the effectiveness of the combat work of German twin-engine bombers was also increased by the high intensity of their use. So, on August 10, 1941, the 2nd bomber squadron, which supported the attack on Leningrad, carried out 5 sorties with each combat-ready crew of O) o17, and Li88 of the 4th air fleet during the battles for Stalingrad in the summer and autumn of 1942 made 5-6 sorties a day⁸, which is a lot for a large twin-engine aircraft. (For comparison: the 202nd bomber air division of the 2nd Air Army of the Voronezh Front in the Belgorod-Kharkov operation in August 1943 carried out an average of only 0.8 combat sorties per day.) This intensity, in turn, became possible both due to the efficient operation of the supply services, and due to the convenience of the German bombers in maintenance and operation. So, it was possible to replace the screw with L188 in three minutes (!), While with DB-3 - in an hour; it took 1.5 hours to remove the motor on the Junkers versus 3 hours on the DB-3, to install the motor - 4 hours versus 1280.

3. WERE THE LOSSES 4088 GREAT AND NOT! eleven?

In evaluating the effectiveness of the combat work of two Luftwaffe motor bombers on the Soviet German front, it is necessary to take into account the magnitude of their combat losses. So far, only fragmentary data on this subject have been published. So, according to the documents [of the group of the 28th bomber squadron (December 15, 1941, it was renamed the III group of the 26th bomber squadron), its 2nd and 3rd detachments, performing from July 22 to December 31, 1941 . about 3000 sorties, lost shot down and written off due to combat damage 20 He! 1181. These data are incomplete: according to the documents of the group, the total number of irretrievably lost and damaged

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the period of the planes turns out to be 33, and according to the report of the 2nd air corps (in which both detachments then operated) - 4182, i.e. 1.24 times larger. Taking into account the latter circumstance, the number of "Heinkels" irretrievably lost by both detachments for combat reasons can be increased from 20 to 25 - which will give a ratio of about 120 sorties for one irretrievable combat loss. It is also known that the group of the 77th bomber squadron operating in the Leningrad strategic direction P from June 22 to October 31, 1941, lost 17 L488, and the 100th squadron that fought (like the above-mentioned detachments of the 28th squadron) bomber group from July 20 to November 13, 1941 lost 14 He! 1183. Even if we assume that all these are combat losses, then even then it will turn out that monthly these units irretrievably lost only 4 and 3.7 aircraft, respectively, for combat reasons. Meanwhile [the group of the 28th squadron - act it in

full, three-squad composition - with the same level of losses that was then in its 2nd and 3rd detachments, it would have to lose 5.7 vehicles every month for combat reasons. It can, therefore, be concluded that the number of sorties per one irretrievable combat loss in the CP group of the 77th bomber squadron and the 100th bomber group in the summer-autumn of 1941 was significantly more than 120, from 150 to 200. It is possible, however, that information about the losses of the 77th squadron and the 100th group is incomplete - but even then, one irretrievable combat loss is unlikely to have less than 120 sorties.

It is further known that in February, March and April 1942, the 1st Air Force of the Luftwaffe, operating in the northwestern strategic direction, having completed 4600, 9075 and 5859 sorties by strike aircraft, respectively, irretrievably lost 9, 12 and 15 twin-engine bombers. The average monthly number of serviceable L188 and He1 11 in the 1st air force was then 44 and 57 units⁸⁴, respectively, and if we assume that they acted with the same intensity as La87, then we get

Xia that in February-April of the 42nd, for one irretrievable combat loss, they accounted for an average of as many as 300 sorties. However, the loss figures are given by day.

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combat operations of the air fleet (and not the reports of the service of the quartermaster general of the Luftwaffe) and are certainly incomplete. It is known that the irretrievable losses of the German 1st Air Division for 5-1] July and the 8th Air Corps for 4-23 July 1943 were underestimated by an average of 1.6 times in the reports of their air fleets⁸⁵; by analogy, the number 300 can be reduced to 187. If, however (which is certainly more accurate) we assume that twin-engine bomb carriers - a significant part of which had to fly to Leningrad, Volkhov and Demyansk from near Riga and Pskov - flew out on combat missions less often than those based in the Luga-Dno Stuka area, then this figure may approach the same 120, and given that some of the losses were non-combat, it will increase again - but in any case, the number of sorties per combat irretrievable loss will fit into the same range of 120-200.

Of course, these figures are obtained on the basis of a very small sample of data, but this sample is random in nature (and therefore, with a very high degree of probability, should reflect a typical picture). In addition, the data, as a result of which the figures were processed, characterize rather large time intervals - and therefore are quite indicative. It is also indicative that a similar level of losses persisted even in the summer of 1943, when the opposition of the Soviet Air Force increased significantly. During the German offensive on the Kursk Bulge, their 1st Air Division and 8th Air Corps - whose bombers made, respectively, about 2600 (from July 5 to July 11, 1943) and about 3340 (from July 4 to July 16) sorties, according to reports services of the Quartermaster General of the Luftwaffe, lost without return, respectively, 16 and 19 188 and He! 1186 i.e. one irretrievable loss accounted for about 162 and 176 sorties. Even adjusted for their approximate nature, these numbers also fit into the range of 120-200, and, taking into account the fact that they also included non-combat losses, the number of irretrievable combat losses per one sortie should already be approaching some 120, like 200 .. .

Therefore, we can consider these figures (from 120 to 200 sorties per one irretrievable combat loss) as indicative - and compare them with the level of losses of the Soviet bomber

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directing aviation. This latter ratio, close to 120-200:1, was achieved only in 1945 (when it amounted to 133:1); in the period from June 26, 1941 to July 1, 1942, for one combat irretrievable loss in it,

there were only 14 sorties (i.e., an order of magnitude less than the Germans), and in August 1942 - May 1943 - 2887. In the 16th Air Army of the Central Front during the defensive battle on the Kursk Bulge (5 - July 11, 1943) for one bomber irretrievably lost for all reasons, there were 62 sorties (2.7 times less than that of the enemy), in the 5th Air Army in the Belgorod-Kharkov operation (August 3-23, 1943 d) - 65, in the 4th bomber air corps in 1944, and in the 1st guards bomber corps even in the second half of 1944 - 43, in the airborne guards even in 1945 and only for one irretrievable combat loss — 88...88

In certain weeks and months, in certain sectors of the front, the level of losses of the twin-engine bombers of the Luftwaffe was, of course, even higher. For example, in February 1942, trying to stop the offensive of the troops of the Kalinin Front near Rzhev, the P group of the 54th bomber squadron lost not four or five, but 10 Li88 (it is not known, however, how many of them for combat reasons) ?? According to the memoirs of the former navigator Ne!111 L. Khafigorsta, from November 19 to 28, 1942, during the desperate attempts of the 27th bomber squadron to delay the offensive of the Don Front northwest of Stalingrad by attacks from low altitudes, only the 5th detachment her P group lost 7 "Heinkels", i.e. almost 100 percent of the stock. During three massive German raids on Moscow (on the nights of July 22, 23 and 24, 1941), having completed 367 sorties, He! 11, L188 and Oo17 irretrievably lost 8 vehicles?1, i.e. for one bomber shot down or crashed due to combat damage, there were not 120, but only about 46 sorties. At the same time, Pi Shgruppa of the 55th bomber squadron, having made 300 sorties in June 1943 to bomb Gorky and Saratov, lost only one He! August 1942 in Stalingrad (when 188 and No! 11

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about 1000 sorties were completed) were there only two aircraft? - which gives, respectively, 300 and about 500 sorties for one irretrievable loss. Therefore, the figures of 120-200 sorties per irretrievable combat loss are really average. And this allows us to assert that the level of loss of Li88 and He! 11 during the period when they operated during the day, i.e. in 1941-1943 it was significantly lower than that of Soviet front-line bombers (in the first year of the war, by an order of magnitude, and in the summer of 1943, by 2-3 times). At the beginning of 1944, the transfer of a significant part of the German bomber aviation of the Eastern Front to night operations made its losses even lower. So, having made a significant number of sorties in May - July 1944, [Pi Shgruppy of the 55th bomber squadron irretrievably lost 14 He! 1193, those. average monthly losses of one bombardi-

the pilot group (approximately 1, 2 aircraft) turned out to be 3-5 times less than in the summer of the 41st, and in relation to the number of sorties (which, of course, they managed to make less during the night than during daylight hours) - times one and a half less.

4. WAS IT EASY TO DOWN THE GERMAN BOMBERS?

Relatively small losses of La88 and He! 11 were caused, firstly, by the poor training and inexperience of the majority of Soviet fighter pilots, which were especially noticeable in 1941. Of course, there were exceptions even then; for example, on June 22, 1941, I-153 of the 12th Fighter Aviation Regiment of the 64th Fighter Aviation Division of the Air Force of the 12th Army of the Southwestern Front in the Stanislav-Galich area shot down, according to German data, immediately 7 L188 from the Shgroup of the 51st Bomber squadrons, and the MiG-3 of the 149th regiment of the same division destroyed another 6 Junkers of this group. But those were the exceptions. "All the reports of the commanders of the German bomber units," states W. Schwabedissen, "testify that in 1941 Soviet fighters did not pose a threat to bomber formations and often avoided combat with the latter."

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So, J. Jodike, who then commanded Detachment 188 in the 3rd bomber squadron in the central sector of the council of the Sco-German front, recalled that "until the autumn of 1941, his unit either did not encounter Soviet fighters, or they simply did not attack". H. von Reisen, who fought in the 41st on L188 in the P group of the 30th bomber squadron in the Arctic, "somewhat almost did not collide with Russian fighters, and they did not even open fire"⁹⁵. In those cases when the red-star "hawks" nevertheless attacked the German bombers, they usually fired from too long distances and from unfavorable angles, did not coordinate their actions - in a word, demonstrated complete tactical illiteracy. According to the Soviet side, during the first German raids on Moscow in July 1941, the pilots of the 6th Air Defense Fighter Corps aimed not at the cockpits or engines of the bombers, but ... at the crosses on the fuselage⁵, i.e. on the least vulnerable places of these machines!

In 1942-1943, the Germans note, "Soviet fighters in their attacks began to be distinguished by great stubbornness" - but they were still let down by inexperience and poor tactical training. The fire was still often opened from too great distances, the attacks were haphazard and disorganized. Although, according to R. Brunner, a veteran of the 55th bomber squadron, Soviet fighters have learned to use sectors that cannot be fired from the He1 11 side ("dead zones"), they still almost never attacked the Heinkel simultaneously from both sides (which is sharp increased-

increased the chances of winning, as it forced the gunners of the bomber to disperse defensive fires, respectively, to reduce its density). Brunner, it is true, believed that in 1943 Soviet fighters were already "fighting quite successfully" against He111 and La88. However, in general, the opinion of the officers of the Luftwaffe bomber aviation - the respondents of V. Schwabedissen - boiled down to the fact that "the increased defense capability of Russian fighters in 1942-1943. still failed to largely prevent German bomber raids"?7. And the Soviet night fighters, according to the enemy, are also in

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The 43rd were no good at all: the night training of the pilots was weak, the tactics were primitive. It is no coincidence that, having made about ten night raids on Gorky and Saratov in June 1943, the 55th bomber squadron did not lose a single "heinkel" from the attacks of air defense fighters³⁸.

In the summer of 1944, the opposition of Soviet fighters finally became such that the Germans transferred L / a88 and He! 11 to operations exclusively at night. However, one gets the impression that this decision of the Luftwaffe command was to a large extent a reinsurance and was caused primarily by the quantitative (rather than qualitative) growth of Soviet fighter aircraft. After all, as W. Schwabedissen points out, in 1944 "reports again and again note the caution of Soviet fighter pilots when attacking German bombers" in daylight conditions? As for the night pilots, although their tactical training had improved significantly compared to 1943, all their efforts were nullified by their technical backwardness - the lack of radars. Therefore, according to the Germans, the results of the actions of the Soviet night fighters and the 44th "were insignificant" ... 100

Another reason for the relatively small losses of L188 and He! 11 was their effective defensive tactics - which, in turn, allowed the high flight training of pilots. Throughout the war, German bombers flew in compact formations, skillfully maintaining a tight formation - a skill that until 1944 was not given, as we have seen, to poorly trained pilots of the Pe-2 and Il-2 ... The compactness of battle formations reduced the number directions from which this or that aircraft could be attacked by fighters, and made it possible to focus many machine guns on the attacking fire. Therefore, it compensated for the relative weakness of the armament of one of the two main aircraft of the German bomber aviation - L188. Even on the machines La88A-4. and LA88A-14, which prevailed in 1942 and 1943, respectively, the most dangerous - the rear hemisphere was covered by only four rifle-caliber machine guns - two 7.92-mm MO81 in ball mounts mounted in

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the rear panel of the cockpit canopy, and two (twin installation MO817,) in the ventral gondola. At the same time, the sectors of fire of the machine guns placed in the cockpit, which was cramped for them, were insufficient!

1. A more effective weapon - a large-caliber, 13.1-mm machine gun MS 131 in the windshield of the cockpit canopy and a 20-mm MCEE cannon in the nose of the fuselage on part L188A-4 and a MYOE cannon in the ventral gondola on L188A-14102 - protected only the front hemisphere... The events of October 22, 1941, when the fighters of the 6th Air Defense Air Corps managed to upset the battle formations of the German bomb carriers going to Moscow, are the best evidence of the importance of keeping the bombers in close formation, and they immediately lost 13 La88 and Ne !11 (including the 53rd bomber squadron - 7 "Heinkel")!103 But such cases were exceptions. Back in 1942-1943, the Germans note, "the good organization of control of German bombers in repelling attacks by Russian fighters in most cases brought to naught all the efforts of the latter to thwart the strike on ground targets. Stunned by the sudden dense barrage, the Russians quickly left the combat course and rarely returned to attack again. When, in December 1942-January 1943, He111 from the 4th, 27th, 55th and 100th bomber squadrons supplied the German group encircled near Stalingrad, Soviet fighters "did not come close to them, as their barrage was very powerful. Often, Soviet fighters did not even attempt to attack large formations of He111". And even in 1944, "losses were relatively small when the German bombers flew in close and echeloned formation, and each link fired aimed concentrated barrage fire. Under such conditions, Russian pilots, as a rule, did not launch a second attack"!04. "Many could not stand it and left the attack," confirms the reports of German experts F.F. fighter division on the Voronezh, Steppe (2nd Ukrainian) and 1st Ukrainian fronts. "When," he explains, "when

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the fighter pilot goes on the attack - especially at the bomber, and the gunner or gunners shoot at him, and the tracks go either to the left or to the right of the cockpit and pass closer and closer, the feeling a person experiences is very unpleasant! The same is recalled by I.I. Kozhemyako: after direct escort of attack aircraft, the most difficult task for a fighter pilot is

attack bombers, "especially if there are a lot of them - 2-3 nines and more. Fuck knows where their arrows are firing! In all directions. You will never say for sure: either for you, or "into the white world like a penny." Nothing depends on you here, and this is very unpleasant. Although the Germans had weak machine guns and "not very" arrows, it was still hard. She's a fool, she doesn't understand a bullet - when it's into bulletproof glass, and when it's into the head [and since a large group of bombers fires a lot of bullets, the probability of getting one of THEM Not "in bulletproof glass", but "in the head" turns out to be quite high. — A.S.]...106 He!11 bombers were also rescued by their strong defensive armament. On the He!11N-4, H-5 and H-6 used in 1941, the rear hemisphere was covered by five 7.92-mm machine guns, which shot through a much larger area than three or four barrels on the La88, and, we add, more powerful ones, than the Soviet ShKAS (one MS15 in the upper turret, one in the rear of the ventral fuselage of the gondola, one each in the sides of the fuselage and one fixed remote MO17 above the tail spinner). Appeared in 1942, He! 11N-1iN-16, while maintaining the total number of barrels, the weight of the volley and the damaging effect increased significantly: the remote MO17 was removed, but instead of the lower MS 15, a pair of much faster-firing MS81 - MO811 was installed, and instead of the upper MS 15 - large-caliber MO 131. On aircraft of submodifications N-11 / K1iN-16 / KJ with MO817 twins were replaced and both single MO 15 in the sides of the fuselage - so that the total number of trunks that shot through the rear hemisphere increased to seven. At No! 11ÿ-20/ÿ2 and Not! 11ÿ-20/ÿ4,

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production of which began at the end of 1943, it decreased to six, but there were already two large-caliber ones: another MO 131 was installed instead of the ventral pair of MS817. At the same time, already on the He111N-11, the turret of the upper machine gun became completely shielded - which made it easier for the shooter to conduct effective fire. (In front of all Heinkel Lee bombers, two barrels were protected - as a rule, a 20-mm MCEE cannon in a ball mount in the nose of the fuselage and an MS 15 machine gun in the front of the ventral gondola! 97.) Starting with the H-11 modification, machine guns "Hein Kelly" were no longer equipped with simple ring sights with a front sight, but collimator ones - and even with a mechanism for stabilizing their own speed. This further increased the chances of the German crew "safely from hitting attacks in air combat" - as well as a large machine gun peck. Until the ammunition was completely used up, the Heinkel gunner could fire for 75 seconds, while the Soviet bomber gunner could fire only 15 seconds...108

M.S. Solonin, however, recalls that machine guns of rifle caliber (which remained predominant in the defensive armament of He! 11) were no longer reliable protection against typical fighters of the Second World War

wars - armed with cannons and heavy machine guns (and therefore capable of hitting the Heinkel from a distance exceeding the effective fire range of most of its machine guns. - 4.S.). In addition, there were fewer shooters on the Heinkel than machine guns, and, moving from one installation to another, the shooter could miss the enemy!⁹⁹. But for a reliable defeat of the bomber, it was still necessary to get close enough to it. And the arrows, apparently, still managed to move quite quickly - otherwise it is impossible to explain why the conclusion about the great power of defensive fire even from a single He! 11 is also done by all Soviet front-line pilots, whose opinion on this matter is contained in published sources. Even the above mentioned I.I.

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precisely because of its armament: if the L188 had a "dead zone" in the tail that was not shot through by defensive fire, then No! 11] "there are no "dead zones". Everything around him was shot with arrows. Nine "Heinkels" is coming - do not step up! 10. "This is some kind of horror! [...] "111th" with its powerful airborne weapons and the ability to shoot in all directions - this is a very difficult aircraft to shoot down, "confirms A.E., who fought in the Kuban in the spring of 1943 in the ranks of the 236th Fighter Aviation Regiment .ShVvarev (whose La-5 was then shot down by the ventral gunner of the "hein kel")!11. "It was very difficult to shoot down this bomber," notes G.A. Baevsky, who met with these machines more than once in the summer of 1943, when his 5th Guards Air Army of the Southwestern Front participated in the Izyum-Barvenkovskaya and Donbass operations. So, on July 19, 1943, in order to shoot down He1 11, Lieutenant Nant Baevsky had to use 360 20-mm shells, and on August 15 - 380 (i.e., almost the entire ammunition load of his La-5)!12; apparently, it was necessary to first neutralize the numerous shooters of the "Heinkel" ... It was even more difficult for the pilots who were less tenacious than the "shop kina", the "Yakovlevs"; about how these fighters quite often died when trying to attack He11] back in the summer - autumn of 1943, can be seen, for example, from the memoirs of those who then served in the 91st 728th Fighter Aviation Regiments of the 256th Fighter Aviation Division of the 2nd Air armies of the Voronezh Front V.P. Markov, A.V. Vorozheika and A.I. Vybornov!¹³. Having attacked on July 5, 1943, over the northern face of the Kursk Bulge, the He111 formation, the eight of the 53rd Guards Fighter Aviation Regiment of the 1st Guards Fighter Aviation Division of the 16th Air Army of the Central Front shot down one aircraft, but lost two Yak-1s; the Yak-1 was also set on fire! junior lieutenant V.K. Eight of the 5308th Fighter Wing of the 205th Fighter

air divisions of the 2nd Air Army destroyed three He! 11 from the [group of the 100th bombing squadron at the cost of losing only one Yak-76 - but

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On July 8, six of the 438th regiment of the same division, failing to win a single victory, lost two Yak-76114s in a battle with the Heinkels. Judging by the battles that are described in the monograph by V.G. Gorbach on the actions of the Soviet Air Force in the Battle of Kursk, shooting down Ne | 1] "yaks" succeeded, as a rule, only with a surprise attack. «[...] I had to meet in the air several times with Russian aviation, but due to the fact that Xe-111 aircraft have strong weapons, they usually fly in nines, the Russians fall off and do not accept combat, "this is an unpleasant phenomenon for the Soviet side. Shot down on July 14, 1943 over the southern face of the Kursk Bulge, Lieutenant R. Marggraf from the P group of the 27th bomber of the firing squadron made, despite the fact that he was in captivity, so that it is trustworthy ...! 15 In general , powerful defensive armament He11] made this slow-moving bomb carrier a tougher nut to crack for Soviet fighters than the faster and no less durable L188.

Anti-aircraft artillery (as the same Marggraf once again noted) was a much more dangerous enemy of L188 and He!111 than fighters. It was she who forced the German bomb carriers to raise the height of their bomb drops from 2500 to 4000 m during the Battle of Kursk - which began to affect the accuracy of bombing. As shown by M.E. Morozov, it was precisely because of her that during the operations "Eisstoss" and "Goetz von Berlichin gene" - the strikes of the 1st, 3rd, 4th and 53rd bomber squadron and L187 on the ships of the Baltic Fleet on the Neva vapre le 1942 - The Germans "dropped bombs without entering the zone of effective anti-aircraft fire, from too high altitudes and without aim. It was in this way that they avoided tangible losses, but the task that confronted them remained unfulfilled"!16. However, Soviet rear facilities often had insufficient anti-aircraft artillery cover. Therefore, for example, the famous raid on the Poltava airfield on the night of June 22, 1944 went completely unpunished for the Luf Twaffe: none of the approximately two hundred He! not on aimed fire using gun-guided stations and radars, but on non-aimed

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barrage - the fixed zone of which the planes could bypass, maneuvering along the course and height! 18. Possibly, the tactics used by the pilots of the German bombers in the fight against anti-aircraft guns also had an effect. So, in 1942, L188 began to strive to slip through the zone

strong anti-aircraft fire while diving: after all, it is much more difficult for anti-aircraft gunners to catch an aircraft that quickly and continuously changes its flight altitude. At the same time, the Germans did not release the brake bars (in order to develop as high a speed as possible!) And entered into a dive, even if they were not going to drop bombs before leaving it. As tests showed, during the withdrawal of the L188A-4 from a dive with a load of bombs, its planes "were only slightly deformed, which was neglected at the front!"¹⁹. It is clear that only well-trained pilots could perform such evolutions on a 13-14-ton machine ...

5. CONCLUSION

So, repeatedly (unlike the Soviet) achieving indisputable tactical, operational and strategic successes, the German bomber aviation did not, moreover, suffer such significant losses as the Soviet one. At the same time, the German side had fewer bombers throughout the war than the Soviet side. Thus, on June 22, 1941, 3888 Soviet bombers and only 945 German ones could enter the battle on the Soviet-German front; on July 5, 1943, the Germans had 552 L188 and He! 1] (all of them supported the offensive on the Kursk Bulge), and the Soviet Air Force - over 850 Pe-2s, several hundred "Bostons" and up to 700 long-range bombers!²⁰. It must therefore be admitted that the German bomber aviation operated on the Soviet-German front more effectively than the Soviet one.

The immediate reasons for this higher efficiency were:

a) skillful actions of the German aviation command, skillfully massaging the forces of bomber aviation in the most critical sectors of the front at the moment, and

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6) the high effectiveness of bombing strikes - provided both by the significant power of the bomb salvo of the La88 and He! 111 aircraft (on average, three times greater than that of the main Soviet front-line bomber Pe-2), and by the high accuracy of bombing. In turn, this latter was achieved thanks to the good aiming equipment and good piloting qualities of the L188 and He!11 bombers, the good adaptability of the La88 to deliver precision strikes from a dive, and most importantly, thanks to the high level of training of the crews.

The same excellent training of pilots - which allowed them to use effective defensive tactics - reduced (along with the poor preparedness of most Soviet fighter pilots) and combat losses of the German

some bombers - further increasing the effectiveness of the latter as a result.

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CONCLUSION

An analysis of Soviet and German sources introduced into scientific circulation over the past 15-20 years leads us to an unequivocal conclusion: Soviet aviation operated in the Great Patriotic War less effectively than non-German. Far more numerous than the Loof Twaffe, the Soviet Air Force achieved less success and suffered incomparably greater losses. And the Soviet Air Force achieved success to a greater extent by numbers than by skill.

The root cause of the lower efficiency of red-star aviation seems to be just as clear; this is the general cultural backwardness of the then USSR in comparison with Germany. |

This is also the lack of a production culture that, along with other reasons, did not allow to establish high-quality production of aircraft, aircraft engines and aircraft equipment modern for the Second World War.

This is also the lack of design culture - which made Soviet aircraft not as technically complete as German ones, devoid of a number of "little things" that increase tactical flight performance and facilitate the operation of equipment.

This is also the lack of technical culture, which caused the weakness of the scientific and experimental base of aircraft, engine and instrument making, the lack of technical experience and the shortage of qualified scientific and engineering personnel.

This, finally, is the lack of a culture of management, decision-making and intellectual activity - when

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of all possible solutions to the problem, not the most effective one is chosen, but the one requiring the least intellectual effort. Hence, in particular, the "quantitative" thinking of the Soviet leadership, which cared more about increasing the pace of "stamping" aircraft, pilots, navigators, etc., than about improving the quality of training of Air Force personnel. After all, the "quantitative" solution to the problem lies, as they say, on the surface, suggests itself before any other. But "aviation," emphasized the legendary pilot, who commanded in 1942-1944. 1st and 3rd air armies, in 1944-1945. M.M. Gromov, who headed the Main Directorate for Combat Training of Frontal Aviation, is a type of weapon in which quality, not quantity, plays a particularly important role. This also applies to technology, and to the training of people ... ". And the fact that in our country, Mikhail Mikhailovich continues, "mass character was considered important as opposed to quality" testified "to the weakness of our aviation culture"! (read: the decision-making culture of the country's leadership and the Air Force). From the lack of a culture of intellectual activity came the militant unprofessionalism of many Soviet front-line aviation commanders, who did not want to plan the actions of their group during a sortie, forcing their subordinates to fly at unfavorable heights and in ineffective battle formations, take off under fire blocking the airfield "Messers" and so on. - in general, demonstrating the real, in the words of I.V. Stalin, "work for Hitler." After all, ignoring combat experience, neglecting the basics of military art and flying is easier than taking all this into account in the decisions made ... The lack of a culture of intellectual activity also led to the tactical illiteracy of many ordinary pilots, who in battle relied "on brute force instead of fine calculation", i.e. simply did not want

who even flaunted it, laughed at the "scribbles" of A.I. Pokryshkin and treated the calculated German pilots as "cowards" ...

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Ultimately, everything rested on the backlog of the then USSR from the West in terms of the level of the general culture of the population. "I would say that the people there are literate, cultured," noted, for example, in the spring of 1936, returning from a trip to Western Europe, the commander of the troops of the Belarusian Military District I.P. Uborevich. "Although we call their culture bourgeois, I think that knowing mathematics, geography, natural sciences well is not bad"². "Tests of intelligence" carried out by the Germans during the war years among Soviet prisoners of war showed that, although the group with above-average intellectual development showed "outstanding knowledge and talent, surpassing the Western European level", groups with average and below average development (and about 75% of the subjects belonged to them, as well as to other peoples) "turned out to be significantly lower than the German level"...³ Soviet universities had nowhere to get human material in order to train highly qualified engineers in the required quantities; FZU schools, technical schools, schools of junior aviation specialists had nowhere to get human material in order to produce highly qualified workers, craftsmen, technicians, mechanics, air gunners, etc., in the required quantities. Air Force flight schools had nowhere to get human material to train truly competent commanders, pilots, and navigators in the required quantities — people who not only received special knowledge, but were also accustomed to apply this knowledge in practice, i.e. those who are accustomed to analyze the newly formed situation and select (based on their theoretical knowledge) the best option for solving the problem for this situation - accustomed, in other words, to think, to engage in intellectual activity. After all, the culture of thinking is formed by general education: while studying in a general education school, a person constantly encounters new information (in the form of new educational material) and constantly tries to use this information in his own interests, memorizing and analyzing educational material - if not for mastering knowledge, at least in order not to

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have troubles at school and at home, get a document on education, etc. In the USSR, only in 1935 was a firm decision taken to enroll in military schools (since March 16, 1937 - military schools) persons with a general education of at least 7 classes; only a year later, in 1936, this decision was put into practice, and only a year later, in 1937, the general education qualification for candidates for

santa up to 8 classes. A significant part of the Soviet aviation commanders of the Great Patriotic War - those who commanded air armies, air corps, air divisions, air regiments and even part of squadrons - received military education until the end of the 30s. And, for example, on July 15, 1933, among the cadets of military schools of the Air Forces of the Red Army, those who graduated from 9 classes (i.e., complete secondary school) accounted for only 12.4%, who graduated from 7 classes (i.e., incomplete secondary school) - only 26.1%; 58.1% had only a lower (grades 1-6) general education, and 3.4% had never studied at a general education school at all! , ay0.3% was not any?. The general education provided in military schools and academies could provide some knowledge, but the lack of mental training received in the most receptive childhood - that training that teaches knowledge to apply! I couldn't compensate...

Dai 7-8 classes of the Soviet school of the 20-30s. - which only in 1932-1934. abandoned "revolutionary" experiments such as the brigade method of teaching, the abolition of the requirements to memorize theoretical material, textbooks, exams and other "legacy of the royal school" - very often they were only a fiction of incomplete secondary education. "Even persons who formally have a 7-year-old," noted, for example, in 1933 the head of the Main Directorate and (\$1c!) Military educational institutions of the Red Army B.M. Feldman, "actually have very low knowledge"; "a large number of those who formally graduated from 7 or more classes of secondary school, but in fact do not have sufficient and satisfactory training" were accepted into the Soviet

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military schools willows 1935-mb. "We have engineers, technicians," I.P. Uborevich stated in the spring of 1936, "who don't know under what sauce they eat thermodynamics, they don't know simple fractions, because the devil knows what was done in high school" ... /

Therefore, the military education received by many Soviet aviation commanders of the Great Patriotic War often turned out to be only formal. "Our students of all academies," noted on December 9, 1935 at a meeting of the Military Council under the People's Commissar of Defense K.E. Voroshilov, "howl that they are being taught at such a pace that they do not have time to perceive, and therefore the forward movement is idling go." After all, we, the people's commissar explained, "accept people who are unprepared," so they "do not have time to digest what they are given" ... The lack of the habit of mental work prevented not only from assimilating knowledge, but also putting it into practice. The natural result of this state of affairs was recorded in February 1941 by the German Air Force Attaché in the USSR G. Aschen Brenner: "The command of the Soviet Air Force is inert [...]"³.

To a large extent, this lack of a general culture in the pre-war USSR was due to objective reasons - the later start of the industrial revolution in Russia compared to the West, the later start of the spread of universal literacy (if in Prussia universal primary education was introduced in the 18th century, then in our country - only in 1930). But there was also a subjective reason - the social policy of the Bolshevik leadership in the 20s - mid-30s, which was in fact a policy of de-intellectualization of the armed forces. Of course, no one consciously set such a task, on the contrary, the authorities at every step emphasized the importance of education, the need to master versatile knowledge. However, in practice, it was precisely deintellectualization that turned out: after all, for many years (they began to abandon this desire only in 1933, and finally abandoned it in 1936), military educational institutions purposefully sought to equip those who had both knowledge and the ability to apply them. it was most difficult to take possession of the workers and peasants, i.e. persons with

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utterly inadequate level of general education. The terrifying average general educational level of the Soviet cadets-aviators of the 1933 model, which we have described above, was the price for their "valuable in terms of their social and party characteristics": workers and peasants - 96.5% (workers - 79.4%), communists and Komsomol members - 98.2% (communists - 80.5%). And how many capable and trained candidates for flight schools were at the turn of the 30s and 40s. rejected for socio-political reasons by the notorious mandate commissions?

An inevitable consequence of this policy of "training command cadres" was a reduction in the level of exactingness in the training of commanders and military engineers. After all, otherwise illiterate cadets and listeners - who, however, "according to their social and party position, could become good commanders [sic! — A.S.]!"¹ — it would simply be impossible to graduate from a military school or academy! "Military academies and schools are characterized by low exactingness, there is an overestimation of grades!"², the commission of the secretary of the Central Committee of the All-Union Communist Party of Bolsheviks A.A. Zhdanov stated back in May 1940.

As a result, the Red Army - which only in October 1939 ceased to be officially called the Workers 'and Peasants' Red Army - and fought "according to the worker-peasant SKI".

Here we will be pointed out that the Bolshevik leadership simply could not staff the command staff of the armed forces and the airlift personnel of the Air Force with persons with a good general education, but "socially alien" - otherwise

he would not have been able to secure the loyalty of the army. Indeed, in a situation where the policy of reshaping the entire life of Russia according to the Marxist scheme infringed on the interests of the majority of the country's population - the peasantry, the urban middle strata, the intelligentsia - the Bolshevik leadership had no other choice. Well, the more confidently we can assert that the grandiose social experiment started by the Bolsheviks in 1917 became one of the main reasons for the insufficient effectiveness of the actions of the Soviet Air Force in the Great Patriotic War.

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Published in the author's edition

Managing editor I. Petrovsky Art editor /1. Volkov

Technical editor V. Kulagina Computer proofing

S. Kladov Proofreader N. Struenze

Yauza Publishing House LLC

109507, Moscow, Samarkand boulevard, 15

For correspondence: 127299, Moscow, st. Clara Zetkin, 18/5. Tel.: (495) 745-58-23

OOO Publishing House Eksmo

127299, Moscow, st. Clara Zetkin, 18/5. Tel. 411-68-86, 956-39-21. Note glade: mImmlm.eKzto.gi E-

tai: i#o@ek\$to.gi

Signed for publication on 02.09.2010.

Format 84x108 1/32. Headset "Newton". Offset printing.

Conv. oven I. 31.92. Circulation 4000 copies. Order

No. 4002614

Printed at JSC "Nizhpoligraf" 603006 Nizhny

Novgorod, st. Varvarskaya, 32. 1ZVM 978-5-699-44593-6

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comparing operational art and tactics, the level of qualification
of command and personnel, as well as the performance
characteristics of combat aircraft of the USSR and the
Third Reich, the author comes to disappointing, shocking
conclusions and answers to the sharpest and

...
bitter questions: why does our aviation
was much less effective than the German one? Whose
fault is it that "Stalin's falcons" often looked almost like
"whipping boys"? Why, having an overwhelming numerical
superiority over the Luftwaffe, did the Soviet Air Force
achieve much less success and suffer incomparably greater
losses?

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